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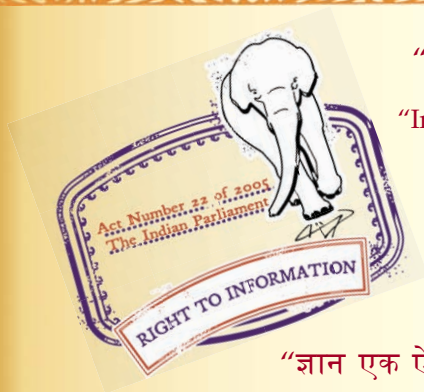
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IS 10208 (1982): Diamond Core Drilling Equipment [MED 21: Diamond Core and Waterwell Drilling]



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IS : 10208-1982

(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR DIAMOND CORE DRILLING EQUIPMENT

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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January 1986



Indian Standard

SPECIFICATION FOR DIAMOND CORE DRILLING EQUIPMENT

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1. Scope

1.1 Lays down the requirements for the following components of the diamond core drilling equipment:

- Drill rods and rod couplings;
- Casings, casing couplings, casing bits, casing shoebits, drive shoes and casing reaming shells; and
- Core barrels, core bits, core lifters, core lifter case and reaming shells.

1.2 It also covers the nomenclature, basic dimensions for drill rods, casings, core barrels and their related diamond set items for the various designs of the core drilling equipment.

1.3 The equipment covered by this standard are suitable for drilling holes from 30-200 mm diameter yielding cores of 18.5-165 mm diameter.

2. Nomenclature

2.1 Identification Symbols — For the identification of the equipment, the following symbols shall be used for various designs of the equipment:

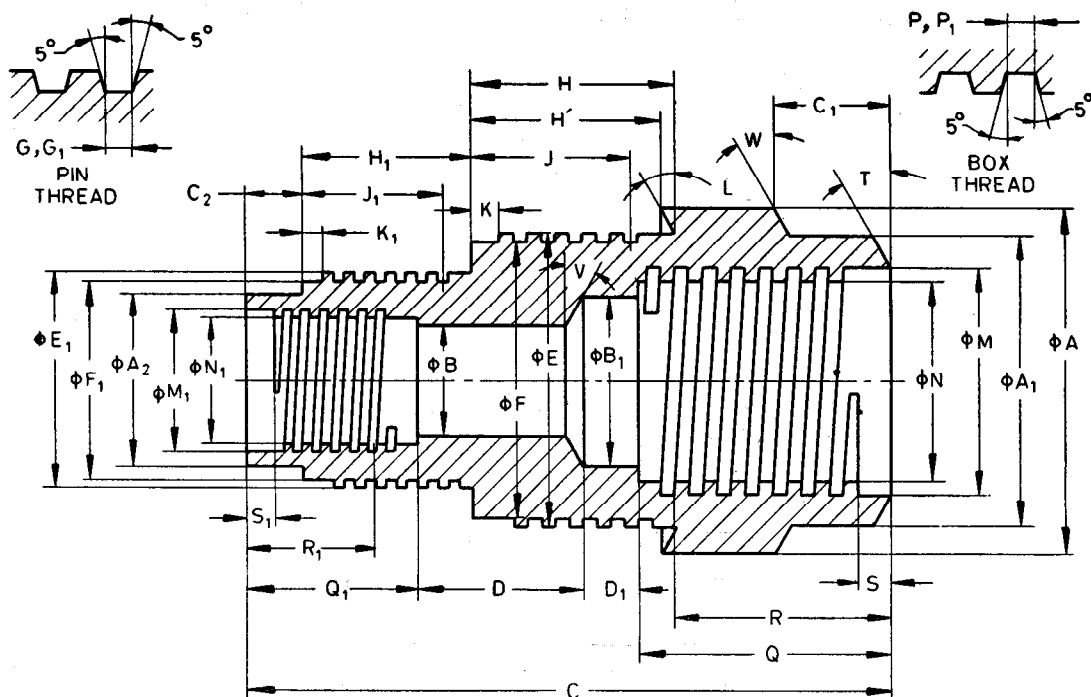
Hole Size Component	R	E	A	B	N	H	P	S	U	Z
Drill rods	RW	EW	AW	BW	NW	HW	—	—	—	—
Casing—flush coupled	RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
Casing—flush jointed	RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
'WF' design, face discharge core barrel	—	—	—	BWF	NWF	HWF	PWF	SWF	UWF	ZWF
'WG' design, bottom discharge core barrel	—	EWG	AWG	BWG	NWG	HWG	—	—	—	—
'WM' design, internal discharge core barrel*	—	EWM	AWM	BWM	NWM	—	—	—	—	—
'WT' design, thin wall, internal discharge core barrel	RWT	EWT	AWT	BWT	NWT	HWT	—	—	—	—
'WTM' design, thin wall bottom discharge core barrel	—	EWTM	AWTM	BWTM	NWTM	HWTM	—	—	—	—

*These may be used with face discharge bits.

2.2 Identification Letters for Dimensional Details — For denoting various dimensions in this standard the identifications as given in Table 1 are being used:

TABLE 1 SYSTEM OF DIMENSIONAL IDENTIFICATION LETTERS

(Clause 2.2)



A, A_1 , etc	Outside diameters — A being largest; A_1, A_2 , etc, progressively smaller
B, B_1 , etc	Inside diameters — B being smallest; B_1, B_2 , etc, progressively larger
C, C_1 , etc	External lengths — C being longest; C_1, C_2 , etc, progressively shorter
* C', C'_1 , etc	External lengths — C' being longest; C'_1, C'_2 , etc, progressively shorter
D, D_1 , etc	Internal lengths — D being longest; D_1, D_2 , etc, progressively shorter
E, E_1 , etc	Major diameter of pin threads — E being largest; E_1, E_2 , etc, progressively smaller
F, F_1 , etc	Minor diameter of pin threads — F being largest; F_1, F_2 , etc, progressively smaller
Thread or pitch	Pin threads
G, G_1 , etc	Width at root of pin thread
H, H_1 , etc	Length of outside diameter machined for external threading
† H', H'_1 , etc	Length of outside diameter machined for external threading
J, J_1 , etc	Minimum length for full depth of pin threads
K, K_1 , etc	Length of relief at the starting point of pin threads
L, L_1 , etc	Angle of bevel for pin thread shoulder
M, M_1 , etc	Major diameter of box threads — M being largest; M_1, M_2 , etc, progressively smaller
N, N_1 , etc	Minor diameter of box threads — N being largest; N_1, N_2 , etc, progressively smaller
Thread pitch	Box threads
P, P_1 , etc	Width at root of box threads
Q, Q_1 , etc	Length of inside diameter machined for internal threading
R, R_1 , etc	Minimum length for full depth of box threads
S, S_1 , etc	Length of counter bore at the starting point of box threads
T, T_1 , etc	Angle of bevel for box thread shoulder
U, U_1 , etc	Included angles — Internal and external
V, V_1 , etc	Internal angles — not pertaining to threaded connections
W, W_1 , etc	External angles — not pertaining to threaded connections
X	Diamond set dimensions — external (OD)
Y	Diamond set dimensions — internal (ID)

Note 1 — All decimal dimensions indicate allowable tolerances.

Note 2 — C', C'_1, H', U and U_1 not shown in the figure.

*Wherever the values of C', C'_1 , etc, are given in addition to C, C_1 , etc, the dimensions C, C_1 , etc, are for reference only and dimensions C', C'_1 , etc, are for actual measurements.

†Wherever the values of H', H'_1 , etc, are given in addition to H, H_1 , etc, the dimensions H, H_1 , etc, are for reference only and dimensions H', H'_1 , etc, are for actual measurement.

3. Dimensions

3.1 Basic Dimensions

3.1.1 Drill Rods, Casings and Their Related Diamond Set Items

Drill Rod	Rod Tube	Rod Coupling	Casing Flush Coupling	Casing Tube	Casing Coupling	Casing Flush Jointed	Casing		Casing Reaming Shell Set	Casing Bit Set		Casing Shoe Set	
	OD	ID		OD	ID		OD	ID		OD	ID	OD	ID
RW	27·89 27·76	10·57 10·19	RX	36·63 36·50	30·48 30·23	RW	36·63 36·50	30·48 30·23	not required	37·85 37·59	25·53 25·27	37·85 37·59	30·18 30·05
EW	35·05 34·93	11·35 10·97	EX	46·28 46·02	38·35 38·10	EW	46·28 46·02	38·35 38·10	48·13 47·88	47·75 47·50	35·81 35·56	47·75 47·50	38·02 37·90
AW	43·89 43·64	16·13 15·75	AX	57·40 57·15	48·67 48·41	AW	57·40 57·15	48·67 48·41	60·07 59·82	59·69 59·44	45·34 45·09	59·69 59·44	48·31 48·18
BW	54·23 53·98	19·30 18·92	BX	73·28 73·03	60·58 60·33	BW	73·28 73·03	60·58 60·33	75·82 75·56	75·44 75·18	56·39 56·13	75·44 75·18	60·25 60·12
NW	66·93 66·68	35·18 34·80	NX	89·28 88·90	76·58 76·20	NW	89·28 88·90	76·58 76·20	92·33 92·08	91·95 91·69	72·26 72·01	91·95 91·69	76·12 75·87
HW	89·28 86·90	60·71 60·32	HX	114·68 114·30	100·38 100·00	HW	114·68 114·30	101·60 101·22	Not required	117·68 117·27	96·06 95·81	117·65 117·27	99·82 99·57
			PX	140·74 138·66	127·38 122·30	PW	140·74 136·86	127·38 123·57	Not required	143·76 143·26	117·86 117·48	143·76 143·26	121·64 121·16
			SX	169·55 167·00	152·45 147·70	SW	169·55 167·00	155·56 151·21	Not required	172·72 172·21	143·26 142·88	172·72 172·21	146·94 146·58
			UX	195·12 192·23	179·20 176·20	UW	195·12 192·23	180·54 175·79	Not required	198·50 197·74	171·83 171·32	198·50 197·74	175·64 175·13
			ZX	220·73 217·42	205·94 201·60	ZW	220·73 217·42	208·46 203·00	Not required	224·16 223·39	197·23 196·72	224·16 223·39	201·04 200·53

3.1.2 Core Barrels and Their Related Diamond Set Items

Core Barrel Designs					Coring Bits Set ID	Coring Bits Set OD	Reaming Shells Set OD	Kerf Width Min	Kerf Area cm ²	Core Area cm ²	Hole Area cm ²	Core to Hole Ratio Percent	Nominal Core Size	Nominal Hole Size
WF	WG	WM	WT	WTM	18'80 18'54	29'59 29'34	29'97 29'72	5'59	4'25	2'74	6'99	39'1	18'5	30'0
	EWG	EWM			21'59 21'34	37'46 37'21	37'85 37'59	8'13	7'55	3'62	11'17	32'4	21'5	38'0
			EWT	EWTM	23'11 22'86	37'46 37'21	37'85 37'59	7'37	7'03	4'15	11'17	37'1	23'0	38'0
	AWG	AWM			30'23 29'97	47'75 47'50	48'13 47'88	8'94	10'99	7'12	18'10	39'3	30'0	48'0
			AWT	AWTM	32'66 32'41	47'75 47'50	48'13 47'88	7'72	9'79	8'32	18'10	45'9	32'5	48'0
	BWG	BWM			42'10 41'91	59'69 59'44	60'07 59'82	8'94	14'34	13'88	28'22	49'1	42'0	60'0
			BWT	BWTM	44'58 44'32	59'69 59'44	60'07 59'82	7'75	12'70	15'52	28'22	55'0	44'5	60'0
	NWG	NWM			54'86 54'61	75'44 75'18	75'82 75'56	10'46	21'46	23'53	44'99	52'2	54'5	76'0
			NWT	NWTM	58'88 58'62	75'44 75'18	75'82 75'56	8'46	17'88	27'11	44'99	60'0	58'5	76'0
HWF	HWG				76'33 76'07	98'98 98'60	99'36 99'11	11'51	31'74	45'61	77'34	59'0	76'0	99'0
			HWT	HWTM	81'08 80'82	98'98 98'60	99'36 99'11	9'14	25'88	51'46	77'34	66'5	81'0	99'0
PWF					92'33 91'95	120'27 119'76	120'78 120'40	14'22	47'53	66'68	114'21	58'4	92'0	121'0
SWF					112'95 112'57	145'67 145'16	146'18 145'80	16'61	67'52	99'86	167'39	59'7	112'5	146'0
UWF					140'08 139'57	174'12 173'36	174'75 174'24	17'32	85'59	153'56	239'15	64'2	140'0	175'0
ZWF					165'48 164'97	199'52 198'76	200'15 199'64	17'32	99'43	214'41	313'84	68'3	165'0	200'0

3.2 Detailed Dimensions — See various sections as follows:

- SECTION 1 — Drill rods
 SECTION 2 — Casings
 SECTION 3 — Core barrels — 'WF' Design
 SECTION 4 — Core barrels — 'WG' Design
 SECTION 5 — Core barrels — 'M' Design
 SECTION 6 — Core barrels — 'WT' Design
 SECTION 7 — Core barrels — 'WTM' Design

4. Tolerances

4.1 Eccentricity — Eccentricity is the distance between the centres of the outer and inner diameters. It shall not exceed 10 percent of the nominal wall thickness t . The eccentricity is calculated as follows:

$$\frac{t_{max} - t_{min}}{2t} \times 100$$

where t_{max} and t_{min} are measured values in the same section.

4.2 Straightness — When measured over the whole length of the tube by rolling against a straight edge, the maximum deviation shall not exceed 1 in 1 200.

5. Material

5.1 Unless agreed between the manufacturers and purchaser, the material used for the manufacturer of the equipment shall have the following mechanical properties:

Component	Tensile Strength		Yield Stress		Elongation $5.65\sqrt{S_0}$ Min percent	Hardness HB, Min (for information only)	Heat treatment (for information only)
	N/mm ²	kg/mm ²	N/mm ²	kg/mm ²			
Parallel wall rods	620	63.2	525	53.6	12	183	Tempered
Upset or forged ends of the above parallel wall rods	500	51	310	31.6	18	—	—
Casings and inner and outer tubes, sizes R to H	620	63.2	525	53.6	12	183	Tempered
Casings and inner and outer tubes, sizes R to Z	500	51	310	31.6	18	146	Normalized
Casing coupling sizes R to H	620	63.2	525	53.6	12	183	Tempered
Casing coupling sizes P to Z	500	51	310	31.6	18	146	Normalized
Rod coupling and adaptors	700	71.5	495	50.5	15	209	Quenched and tempered
Core lifter case	620	63.2	525	53.6	12	370	Tempered
Core lifter	—	—	—	—	—	370	Hardened at 820°C and quenched in oil and tempered

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5.1.1 The suitable material for the manufacture of various components is given below for guidance:

Rod couplings and adaptors	Steel designation 40Cr1Mo28 according to IS : 1570-1961 'Schedules for wrought steels for general engineering purposes' or equivalent which will meet the physical properties specified in 5.1
Drill rods, casings, casing couplings, core barrel inner and outer tubes, reaming shells, core bits, core lifter case, casing show bits	Steel designation C35Mn75 or 40Cr1Mo28 according to IS : 1570-1961 or equivalent which will meet the physical properties specified in 5.1
Core lifter	Steel designation 55Si2Mn90 or 40Cr1Mo28 according to IS : 1570-1961 or equivalent which will meet the physical properties specified in 5.1

5.1.2 If welding is used in place of upsetting, the mechanical properties of the welded joint shall conform to values specified in 5.1. The design of the welded joint is at the discretion of the manufacturer.

6. Designation — The components of the diamond core drilling equipment conforming in all respects to this standard shall be designated by the commonly used name of the component, design, type of core barrel and the identification symbol and the number of this Indian Standard.

Example 1:

A 'W' design drill rod for hole of size 'H' and having an effective length of 1.5 m shall be designated as:

Drill rod HW — 1.5 IS : 10208

Example 2:

A 'X' design casing for hole of size 'E' and having an effective length of 3 m shall be designated as:

Casing EX — 3.0 IS : 10208

Example 3:

A 'W' design casing reaming shell for hole of size 'B' shall be designated as:

Reaming Shell — W Design Casing BW IS : 10208

Example 4:

A 'WF' design double tube core barrel for hole of size 'U' and having core barrel length of 3 m shall be designated as:

Double Tube Core Barrel UWF — 3.0 IS : 10208

Example 5:

The inner tube of 'WF' design double tube core barrel for hole of size 'S' and having core barrel length of 3 m shall be designated as:

Inner Tube — WF Design Double Tube Core Barrel SWF — 3.0 IS : 10208

Example 6:

A single tube core barrel of 'WG' design and for hole of size 'H' and having core barrel length of 3 m shall be designated as:

Single Tube Core Barrel HWG — 3.0 IS : 10208

Example 7:

A reaming shell of the single tube core barrel of the 'WG' design for hole of size 'B' shall be designated as:

Reaming Shell — WG Design Single Tube Core Barrel BWG IS : 10208

Example 8:

A double tube core barrel of 'WG' design and for hole of size 'H' and having a core barrel length of 6 m shall be designated as:

Double Tube Core Barrel HWG — 6'0 IS : 10208

Example 9:

The head of the 'WG' design double tube core barrel of size 'A' shall be designated as:

Head — WG Design Double Tube Core Barrel AWG IS : 10208

Example 10:

The core lifter of 'WM' design double tube core barrel for hole of size 'B' shall be designated as:

Core Lifter — WM Design Double Tube Core Barrel BWM IS : 10208

7. General Requirements

7.1 Drill rods, inner tubes of double tube core barrels and single tube core barrel heads may be of welded construction but shall conform in all respects with the requirements of this standard.

7.2 All outer tubes of core barrels shall be chrome plated on outside to a length of 450 mm from the bottom end. The plating shall have a thickness of 0.1 mm minimum.

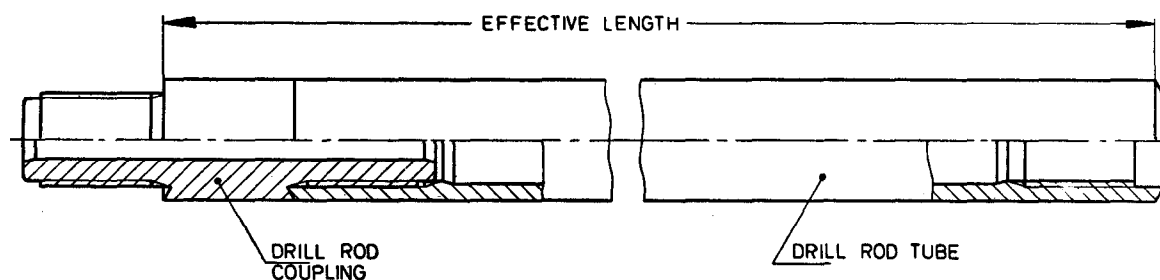
7.3 Unless specified by purchaser, blank core bit and blank reaming shell shall not be supplied with core barrels.

8. Marking — Each assembly or any component, if ordered separately, of the diamond drilling equipment shall be marked with the following:

- Manufacturer's name or identification mark; and
- Identification symbol of the component as given in 2.1.

8.1 ISI Certification Mark — Details available with Indian Standards Institution.

9. Packing — All exposed threads shall be suitably protected against damage during storage and transit.

SECTION 1 DRILL RODS**10. Nomenclature**

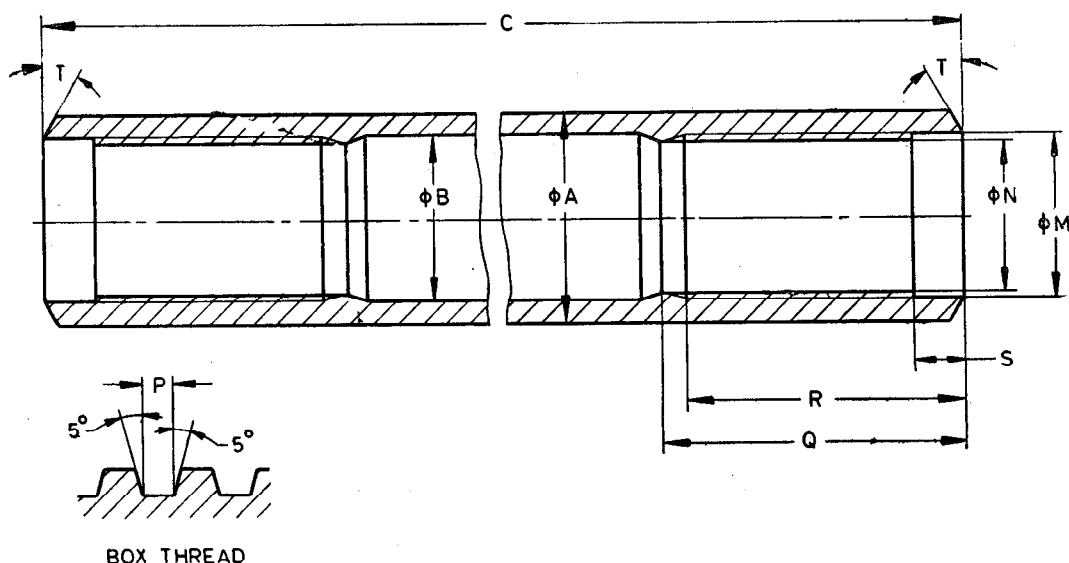
Note — Thread may be left-hand, if required.

All dimensions in millimetres.

Symbol	Rod OD	Coupling ID	Effective Length
RW	27.8	10.4	3 000, 1 500 or 750
EW	35.0	11.2	
AW	43.8	15.9	
BW	54.1	19	
NW	66.8	35	
HW	89.1	60.5	

11. Detailed Dimensions

11.1 Drill Rod Tube



BOX THREAD

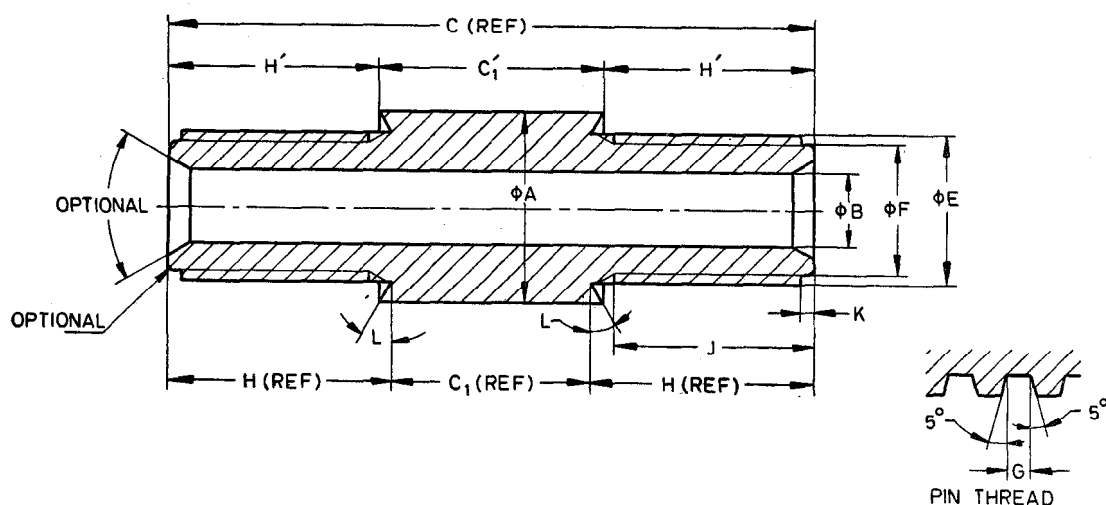
Note 1 — The B diameter dimension is maximum and may apply equally to upset end rods and parallel wall rods in RW size only. On all other sizes, this dimension refers to upset end rods only.

Note 2 — Rods of sizes RW, EW and AW shall normally be supplied as parallel wall rods and rods of sizes BW, NW and HW as upset end rods unless otherwise specified.

All dimensions in millimetres.

Dimension		RW	EW	AW	BW	NW	HW
A	Max	27.89	35.05	43.89	54.23	66.93	89.28
	Min	27.76	34.93	43.84	53.98	66.68	88.90
B	Max	18.26	25.40	34.14	44.45	57.15	77.77
C	Max	2 972.57	2 967.23	2 968.12	2 956.44	2 955.93	2 943.61
	Min	2 971.04	2 965.71	2 966.60	2 954.92	2 954.41	2 942.09
M	Max	21.67	27.13	35.05	42.93	56.49	77.06
	Min	21.62	27.08	35.00	42.88	56.44	77.01
N	Max	18.95	23.95	31.88	38.94	51.71	72.24
	Min	18.90	23.90	31.83	38.89	51.66	72.19
Thread pitch		6.350	8.466	8.466	8.466	8.466	8.466
P	Max	3.18	4.22	4.22	4.22	4.22	4.22
	Min	3.10	4.11	4.11	4.11	4.11	4.11
Q	Max	40.17	44.95	54.48	64.00	76.70	90.97
	Min	39.67	44.45	53.98	63.50	76.20	90.47
R	Max	37.00	40.17	48.13	57.65	70.35	83.05
	Min	36.50	39.67	47.63	57.15	69.85	82.55
S	Max	6.60	8.15	9.78	9.78	9.78	9.78
	Min	6.10	7.67	9.27	9.27	9.27	9.27
T		30°	30°	30°	30°	30°	30°

11.2 Drill Rod Coupling



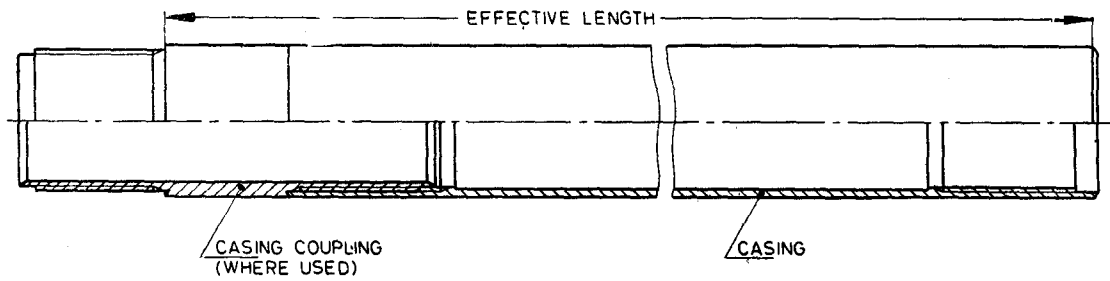
Note — Dimensions shown apply to both ends.

All dimensions in millimetres

Dimension		RW	EW	AW	BW	NW	HW
A	Max	27.89	35.05	43.89	54.23	66.93	89.28
	Min	27.69	34.85	43.54	53.87	66.55	88.77
B	Max	10.57	11.35	16.13	19.30	35.18	60.71
	Min	10.19	10.97	15.75	18.92	34.80	60.32
C		92.25	117.48	133.35	165.10	190.50	228.60
C ₁	Max	28.45	33.78	32.89	44.58	45.08	57.40
	Min	27.94	33.27	32.39	44.07	44.58	56.90
C ₁ '	Max	32.05	38.40	37.99	51.10	51.10	54.41
	Min	31.55	37.89	37.49	50.60	50.60	53.91
E	Max	21.56	26.97	34.90	42.77	56.34	76.91
	Min	21.51	26.92	34.85	42.72	56.29	76.86
F	Max	18.85	23.80	31.72	38.79	51.56	72.09
	Min	18.72	23.67	31.60	38.66	51.44	71.96
Thread pitch		6.350	8.466	8.466	8.466	8.466	8.466
G	Max	3.18	4.22	4.22	4.22	4.22	4.22
	Min	3.10	4.11	4.11	4.11	4.11	4.11
H	Max	33.78	42.21	50.65	60.63	73.08	84.43
	Min	33.27	41.71	50.14	60.12	72.57	83.92
H'	Max	31.98	39.90	48.10	57.37	70.07	80.93
	Min	31.47	39.40	47.59	56.86	69.56	80.42
J	Max	28.58	36.50	44.45	53.98	66.68	79.38
K	Max	1.83	5.00	6.60	8.18	9.80	9.78
	Min	1.32	4.50	6.10	7.67	9.27	9.27
L		30°	30°	30°	30°	30°	30°

SECTION 2 CASINGS

12. Nomenclature

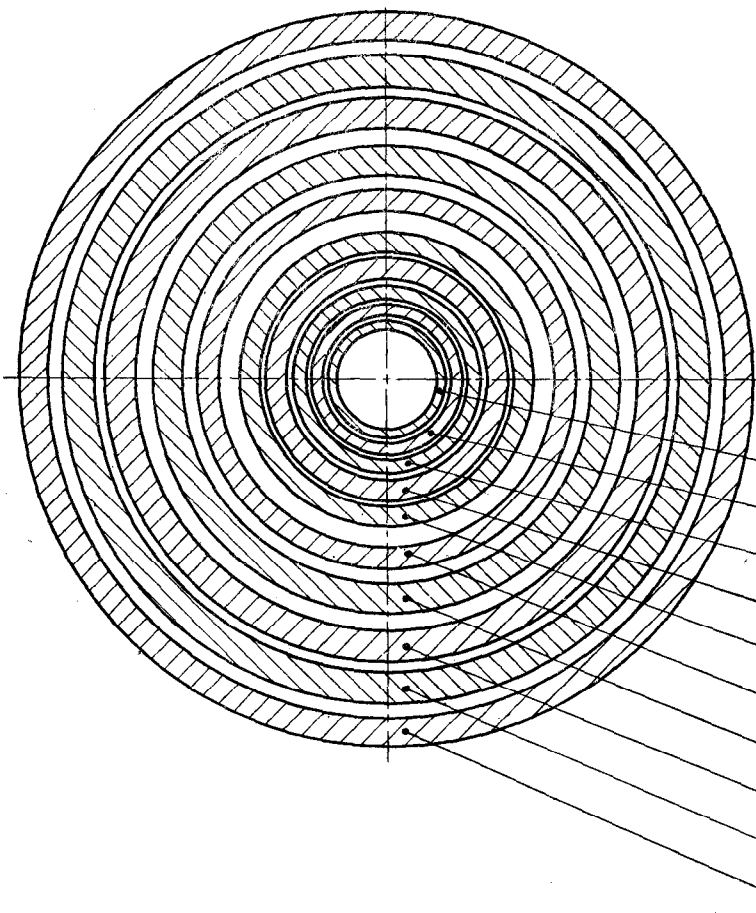


Note — Thread shall be right-hand unless otherwise specified.

13. Main Dimensions

13.1 *Diameters of Casing Tubes*

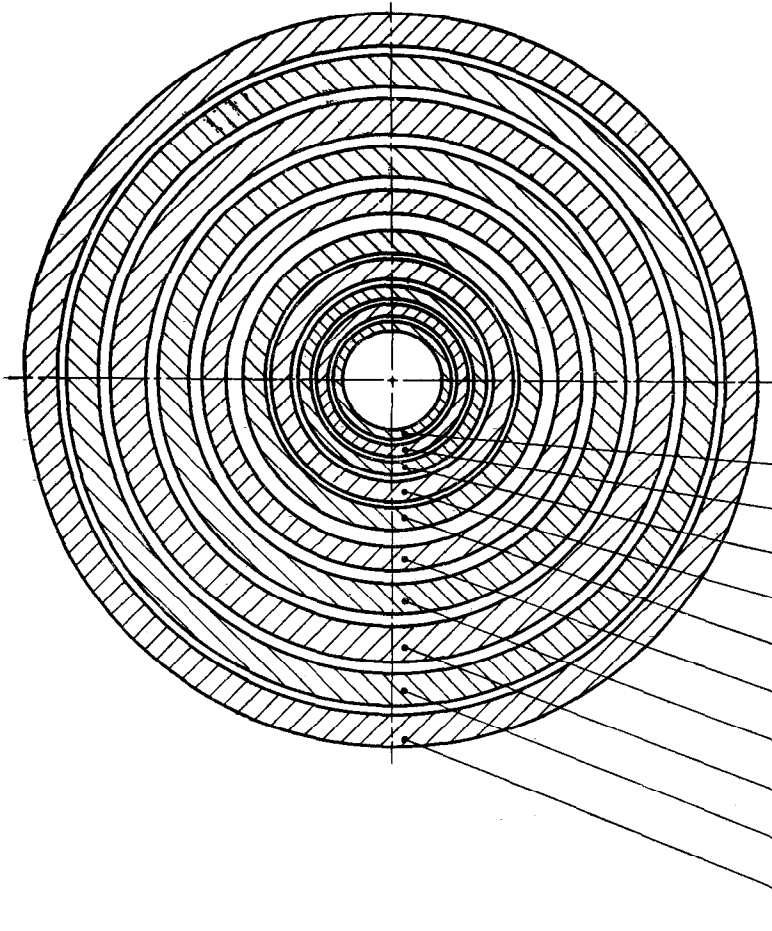
13.1.1 *'W' Design Flush Jointed Casings*



All dimensions in millimetres

REFERENCE	OUTER DIAMETER max.	INNER DIAMETER min.	EFFECTIVE LENGTHS (See Fig. in Clause 12)
RW	36.63	30.23	3000 OR 1500 OR 750
EW	46.28	38.10	
AW	57.40	48.41	
BW	73.28	60.33	
NW	89.28	76.20	
HW	114.68	101.22	
PW	140.74	123.57	
SW	169.55	151.21	
UW	195.12	175.79	
ZW	220.73	203.00	

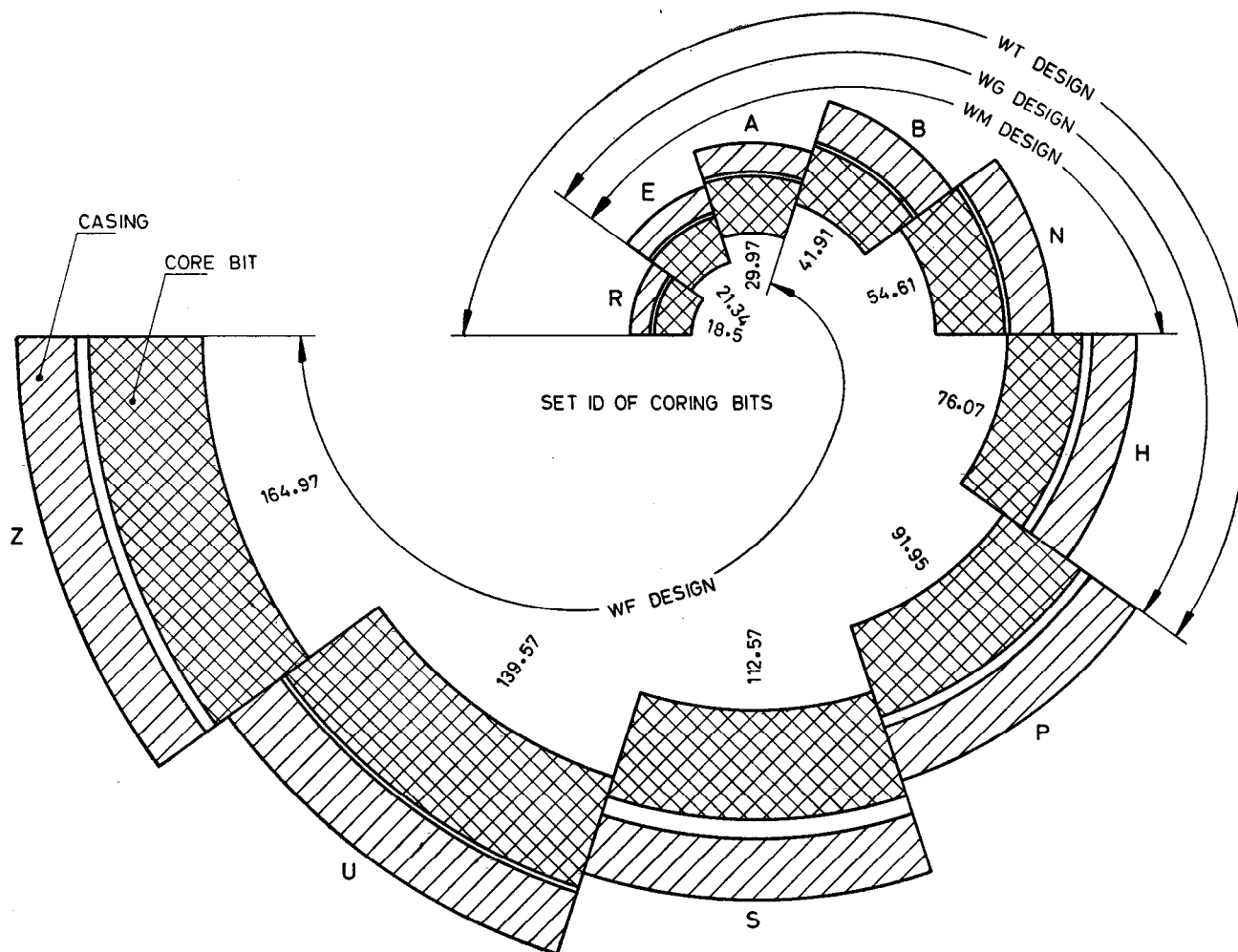
13.1.2 'X' Design Flush Coupled Casing



All dimensions in millimètres

RÉFERENCE	OUTER DIAMETER max.	INNER DIAMETER min.	EFFECTIVE LENGTHS (See Fig in Clause 12)
RX	36.63	30.23	3000 OR 1500 OR 750
EX	46.28	38.10	
AX	57.40	48.41	
BX	73.28	60.33	
NX	89.28	76.20	
HX	114.68	100.00	
PX	140.74	122.30	
SX	169.55	147.70	
UX	195.12	176.20	
ZX	220.73	201.60	

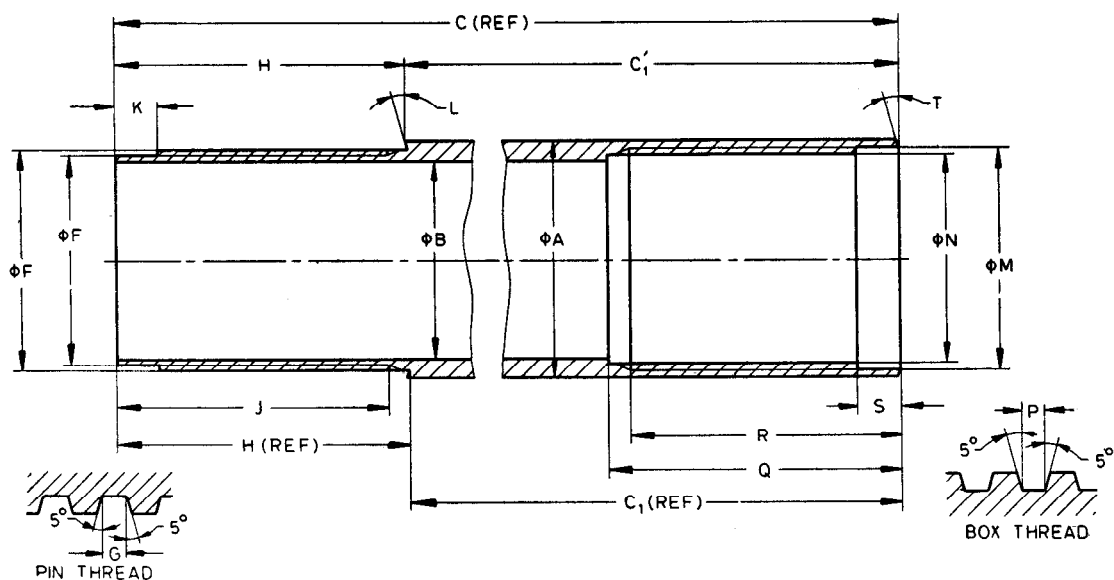
13.2 Relation of Casing to Core Bit



14. Detailed Dimensions

14.1 'W' Design Flush Jointed Casings

14.1.1 'W' Design Flush Jointed Casings — Casing Tube

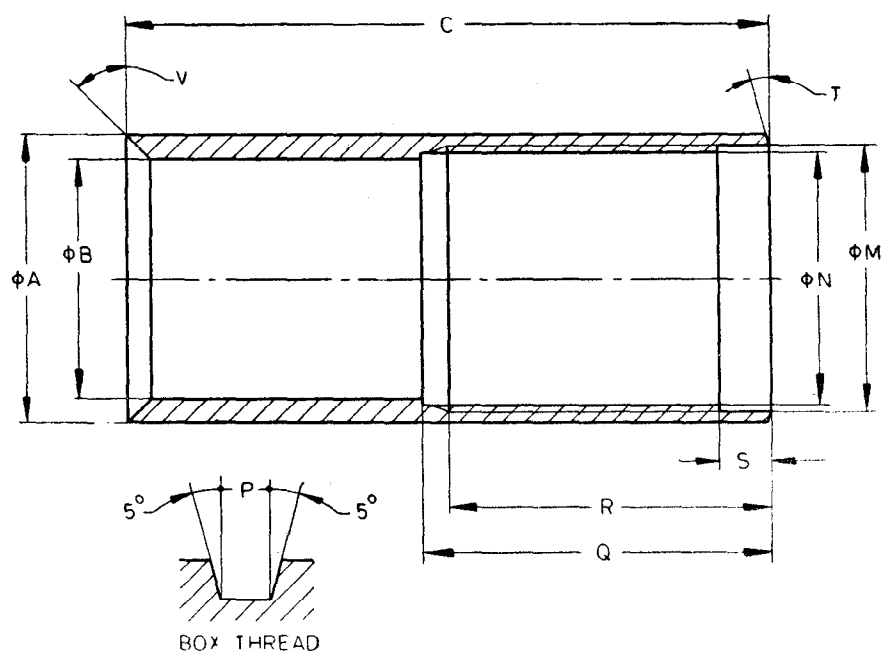


All dimensions in millimetres

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
A	Max	36.63	46.28	57.40	73.28	89.28	114.68	140.74	169.55	195.12	220.73
	Min	36.50	46.02	57.15	73.03	88.90	114.30	138.66	167.00	192.23	217.42
B	Max	30.48	38.35	48.67	60.58	76.58	101.60	127.38	155.55	180.54	208.46
	Min	30.23	38.10	48.41	60.32	76.20	101.22	123.57	151.21	175.79	203.00
C	Max	3 045.52	3 051.87	3 058.22	3 064.57	3 070.92	3 077.27	3 083.62	3 089.97	3 096.32	3 102.67
	Min	3 043.23	3 049.58	3 055.93	3 062.28	3 068.63	3 074.98	3 081.33	3 087.68	3 094.03	3 100.38
C ₁	Max	3 001.19	3 001.19	3 001.19	3 001.19	3 001.19	3 001.19	3 001.19	3 001.19	3 001.19	3 001.19
	Min	2 998.78	2 998.78	2 998.78	2 998.78	2 998.78	2 998.78	2 998.78	2 998.78	2 998.78	2 998.78
C ₁ '	Max	3 001.51	3 001.57	3 001.62	3 001.89	3 001.88	3 001.91	3 001.88	3 001.93	3 001.93	3 001.77
	Min	2 999.10	2 999.16	2 999.21	2 999.48	2 999.47	2 999.50	2 999.52	2 999.52	2 999.52	2 999.36
E	Max	34.19	43.38	54.10	68.00	84.00	109.14	134.59	162.84	188.26	214.81
	Min	34.11	43.31	54.00	67.89	83.90	109.02	134.47	162.71	188.11	214.66
F	Max	32.61	41.07	51.79	65.68	81.69	106.86	131.55	159.79	184.43	210.97
	Min	32.56	41.02	51.71	65.61	81.61	106.76	131.45	159.69	184.30	210.85
Thread pitch		5.080	6.350	6.350	6.350	6.350	6.350	8.466	8.466	12.700	12.700
G	Max	2.64	3.25	3.25	3.25	3.25	4.29	4.29	4.29	6.40	6.40
	Min	2.54	3.15	3.15	3.15	3.15	4.19	4.19	4.19	6.30	6.30
H	Max	44.45	50.80	57.15	63.50	69.85	76.20	82.56	88.90	95.25	101.60
	Min	44.32	50.67	57.02	63.37	69.72	76.07	82.42	88.77	95.12	101.47
H'	Max	44.13	50.42	56.72	62.80	69.10	75.48	81.87	88.16	94.51	101.02
	Min	44.00	50.29	56.89	62.67	69.03	75.35	81.73	88.03	94.38	100.89
J	Min	41.28	47.62	53.98	60.33	66.68	73.02	79.38	85.73	92.08	98.43
K	Max	6.60	7.62	7.62	7.62	7.62	7.62	9.14	9.14	11.18	11.18
	Min	6.10	7.11	7.11	7.11	7.11	7.11	8.64	8.64	10.67	10.67
L		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
M	Max	34.34	43.54	54.31	68.20	84.20	109.42	134.87	163.12	188.62	215.16
	Min	34.26	43.46	54.20	68.10	84.10	109.30	134.75	162.99	188.47	215.01
N	Max	32.72	41.17	51.94	65.84	81.84	107.06	131.75	159.99	184.68	211.23
	Min	32.66	41.12	51.87	65.76	81.76	106.96	131.65	159.89	184.56	211.10
Thread pitch		5.080	6.350	6.350	6.350	6.350	6.350	8.466	8.466	12.700	12.700
P	Max	2.64	3.25	3.25	3.25	3.25	3.25	4.29	4.29	6.40	6.40
	Min	2.54	3.15	3.15	3.15	3.15	3.15	4.19	4.19	6.30	6.30
Q	Max	44.58	50.93	57.28	63.63	69.98	76.33	82.68	89.03	95.38	101.73
	Min	44.45	50.80	57.15	63.50	69.85	76.20	82.55	88.90	95.25	101.60
R	Max	41.78	48.13	54.48	60.83	67.18	73.53	79.98	86.23	92.58	98.93
	Min	41.28	47.63	53.98	60.33	56.68	73.03	79.38	85.73	92.08	98.43
S	Max	6.60	7.62	7.62	7.62	7.62	7.62	9.14	9.14	11.18	11.18
	Min	6.10	7.11	7.11	7.11	7.11	7.11	8.64	8.64	10.67	10.67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°

Note — Exception to dimension B — Manufacturers shall be responsible for maintaining a minimum dimension B for a minimum length of 100 mm from each end. This diameter shall be concentric within 0.10 mm of the thread diameter. Over remainder of bore, stated tolerances must be maintained.

14.1.2 'W' Design Flush Jointed Casings — Casing Drive Shoes

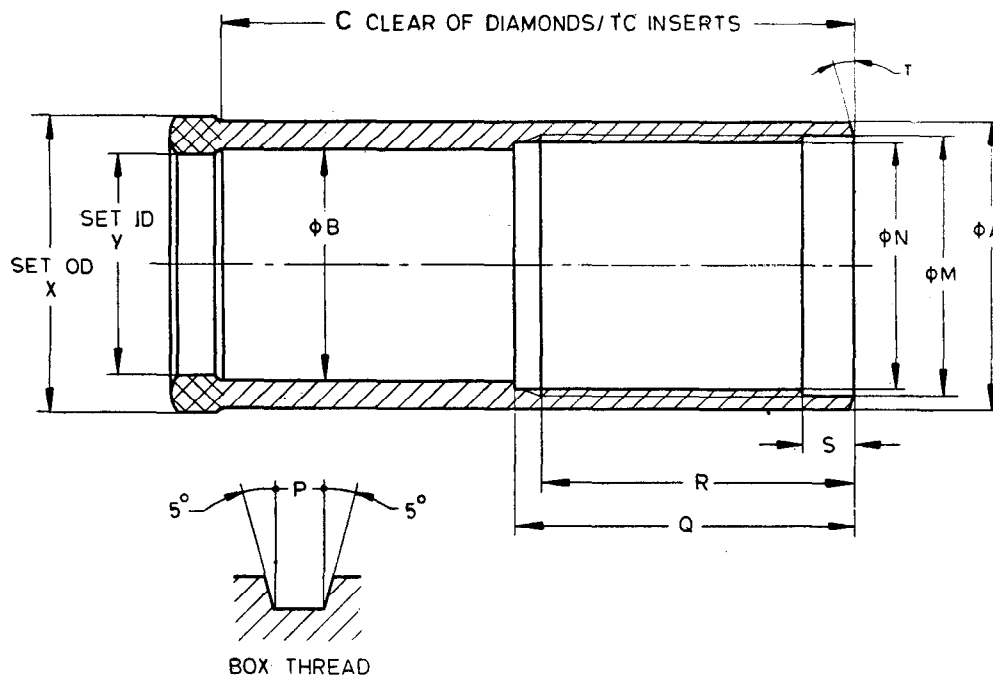


Note — Bevel edge shall have a hardness of 392 to 445 HV (40 to 45 HRC)

All dimensions in millimetres

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
A	Max	36·98	46·53	58·34	73·96	90·47	115·93	142·37	171·20	196·72	222·38
	Min	36·88	46·43	58·24	73·86	90·37	115·82	142·24	171·07	196·60	222·25
B	Max	30·73	38·61	48·92	60·83	76·96	100·97	122·86	148·26	177·22	202·62
	Min	30·23	38·10	48·41	60·33	76·20	100·20	122·10	147·50	176·20	201·60
C	Min	82·55	88·90	95·25	107·95	114·30	127·00	133·35	146·05	152·40	158·75
M	Max	34·34	43·54	54·31	68·20	84·20	109·42	134·87	163·12	188·62	215·16
	Min	34·26	43·46	54·20	68·10	84·10	109·30	134·75	162·99	188·47	215·01
N	Max	32·72	41·17	51·94	65·84	81·81	107·06	131·75	159·99	184·68	211·23
	Min	32·66	41·12	51·87	65·76	81·76	106·96	131·65	159·89	184·56	211·10
Thread pitch		5·080	6·350	6·350	6·350	6·350	6·350	8·466	8·466	12·700	12·700
P	Max	2·64	3·25	3·25	3·25	3·25	3·25	4·29	4·29	6·40	6·40
	Min	2·54	3·15	3·15	3·15	3·15	3·15	4·19	4·19	6·30	6·30
Q	Max	44·58	50·93	57·28	63·63	69·98	76·33	82·68	89·03	95·38	101·73
	Min	44·45	50·80	57·15	63·50	69·85	76·20	82·55	88·90	95·25	101·60
R	Max	41·78	48·13	54·48	60·83	67·18	73·53	79·88	86·23	92·58	98·92
	Min	41·28	47·63	53·98	60·33	66·68	73·03	79·38	85·73	92·08	98·42
S	Max	6·60	7·62	7·62	7·62	7·62	7·62	9·14	9·14	11·18	11·18
	Min	6·10	7·11	7·11	7·11	7·11	7·11	8·64	8·64	10·67	10·67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
V		45°	45°	45°	45°	45°	45°	45°	45°	45°	45°

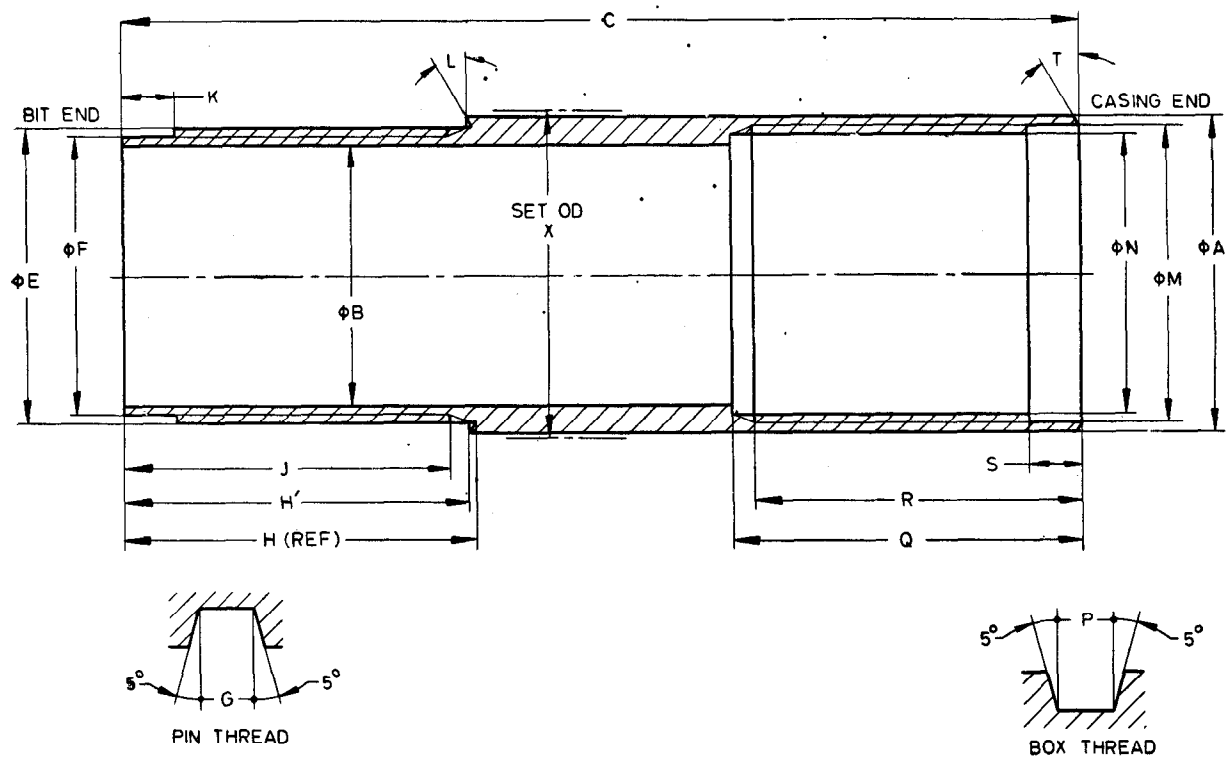
14.1.3 'W' Design Flush Jointed Casings — Casing Shoe Bit



All dimensions in millimetres

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
A	Max	36.98	46.53	58.34	73.96	90.47	115.93	141.33	169.90	195.30	220.70
	Min	36.83	46.43	58.24	73.86	90.37	115.82	141.17	169.75	195.07	220.47
B	Max	30.73	38.61	48.92	60.83	76.96	100.84	122.86	148.26	177.22	202.62
	Min	30.23	38.10	48.41	60.33	76.20	100.08	122.10	147.50	176.20	201.60
C	Min	82.55	88.90	95.25	107.95	114.30	127.00	133.35	146.05	152.40	158.75
M	Max	34.34	43.54	54.31	68.20	84.20	109.42	134.87	163.12	188.62	215.16
	Min	34.26	43.46	54.20	68.10	84.10	109.30	134.75	162.99	188.47	215.01
N	Max	32.72	41.17	51.94	65.84	81.84	107.06	131.75	159.99	184.68	211.23
	Min	32.66	41.12	51.87	65.76	81.76	106.96	131.65	159.89	184.56	211.10
Thread pitch		5.080	6.350	6.350	6.350	6.350	6.350	8.466	8.466	12.700	12.700
P	Max	2.64	3.25	3.25	3.25	3.25	3.25	4.29	4.29	6.40	6.40
	Min	2.54	3.15	3.15	3.15	3.15	3.15	4.19	4.19	6.30	6.30
Q	Max	44.58	50.93	57.28	63.63	69.98	76.33	82.68	89.03	95.38	101.73
	Min	44.45	50.80	57.15	63.50	69.85	76.20	82.55	88.90	95.25	101.60
R	Max	41.78	48.13	54.48	60.83	67.18	73.53	79.88	86.23	92.58	98.93
	Min	41.28	47.63	53.98	60.33	66.68	73.03	79.38	85.73	92.08	98.43
S	Max	6.60	7.62	7.62	7.62	7.62	7.62	9.14	9.14	11.18	11.18
	Min	6.10	7.11	7.11	7.11	7.11	7.11	8.64	8.64	10.67	10.67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
X	Max	37.85	47.75	59.69	75.44	91.95	117.65	143.76	172.72	198.50	224.16
	Min	37.59	47.50	59.44	75.18	91.69	117.27	143.26	172.21	197.74	223.39
Y	Max	30.18	38.02	48.31	60.25	76.12	99.82	121.54	146.94	175.64	201.04
	Min	30.05	37.90	48.18	60.12	75.87	99.57	121.16	146.56	175.13	200.53

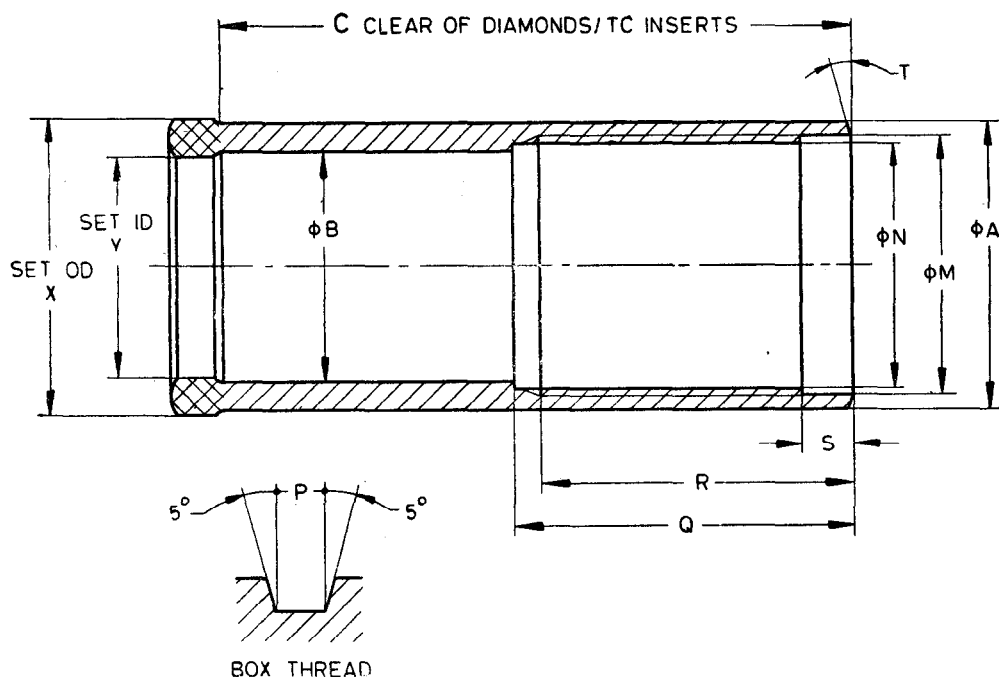
14.1.4 'W' Design Flush Jointed Casings — Casing Reaming Shell



All dimensions in millimetres

Dimension		EW	AW	BW	NW
A	Max	46.53	58.34	73.96	90.47
	Min	46.43	58.24	73.86	90.37
B	Max	38.35	48.67	60.58	76.58
	Min	38.10	48.41	60.33	76.20
C	Min	139.70	152.40	171.45	184.15
E	Max	43.38	54.10	68.00	84.00
	Min	43.31	54.00	67.89	83.90
F	Max	41.07	51.79	65.68	81.69
	Min	41.02	51.71	65.61	81.61
Thread pitch		6.350	0	6.350	6.350
G	Max	3.25	3.25	3.25	3.25
	Min	3.15	3.15	3.15	3.15
H	Max	50.80	57.15	63.50	69.85
	Min	50.67	57.02	63.37	69.72
H'	Max	50.38	56.58	62.70	68.98
	Min	50.25	56.45	62.57	68.85
J	Min	47.62	53.98	60.32	66.68
K	Max	7.62	7.62	7.62	7.62
	Min	7.11	7.11	7.11	7.11
L		15°	15°	15°	15°
M	Max	43.54	54.31	68.20	84.20
	Min	43.46	54.20	68.10	84.10
N	Max	41.17	51.94	65.84	81.84
	Min	41.12	51.87	65.76	81.76
Thread pitch		6.350	6.350	6.350	6.350
P	Max	3.25	3.25	3.25	3.25
	Min	3.15	3.15	3.15	3.15
Q	Max	50.93	57.28	63.63	69.98
	Min	50.80	57.15	63.50	69.85
R	Max	48.13	54.48	60.83	67.18
	Min	47.63	53.98	60.33	66.68
S	Max	7.62	7.62	7.62	7.62
	Min	7.11	7.11	7.11	7.11
T		15°	15°	15°	15°
X	Max	48.13	60.07	75.82	92.33
	Min	47.88	59.82	75.56	92.08

14.1.5 'W' Design Flush Jointed Casings — Casing Bit

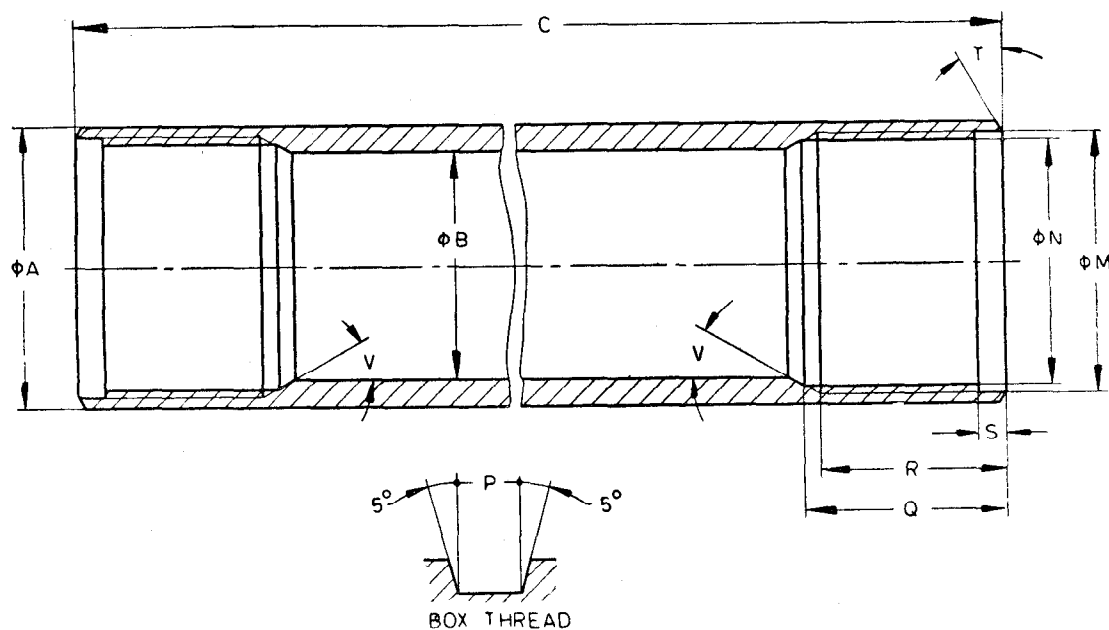


All dimensions in millimetres

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
	Max	36.98	46.53	58.34	73.96	90.47	115.93	141.33	169.90	195.30	220.70
	Min	36.88	46.43	58.24	73.86	90.37	115.82	141.17	169.75	195.07	220.47
B	Max	26.54	37.21	46.74	57.86	73.74	98.35	120.65	146.05	175.13	200.53
	Min	26.04	36.45	45.97	57.10	72.97	97.33	119.38	144.78	173.61	199.01
C	Min	82.55	88.90	95.25	107.95	114.30	127.00	133.35	146.05	152.40	158.75
M	Max	34.34	43.54	54.31	68.20	84.20	109.42	134.87	163.12	188.62	215.16
	Min	34.26	43.46	54.20	68.10	84.10	109.30	134.75	162.99	188.47	215.01
N	Max	32.72	41.17	51.94	65.84	81.84	107.06	131.75	159.99	184.68	211.23
	Min	32.66	41.12	51.87	65.76	81.76	106.96	131.65	159.89	184.56	211.10
Thread pitch		5.080	6.350	6.350	6.350	6.350	6.350	8.466	8.466	12.700	12.700
P	Max	2.64	3.25	3.25	3.25	3.25	3.25	4.29	4.29	6.40	6.40
	Min	2.54	3.15	3.15	3.15	3.15	3.15	4.19	4.19	6.30	6.30
Q	Max	44.58	50.93	57.28	63.63	69.98	76.33	82.68	89.03	95.38	101.73
	Min	44.45	50.80	57.15	63.50	69.85	76.20	82.55	88.90	95.25	101.60
R	Max	41.70	48.13	54.48	60.83	67.18	74.53	79.88	86.23	92.58	98.93
	Min	41.28	47.63	53.98	60.33	66.68	73.03	79.38	85.73	92.08	98.43
S	Max	6.60	7.62	7.62	7.62	7.62	7.62	9.14	9.14	11.18	11.18
	Min	6.10	7.11	7.11	7.11	7.11	7.11	8.64	8.64	10.67	10.67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
X	Max	37.85	47.75	59.69	75.44	91.95	117.65	143.76	172.72	198.50	224.16
	Min	37.59	47.50	59.44	75.18	91.69	117.27	143.26	172.21	197.74	223.39
Y	Max	25.53	35.81	45.34	56.39	72.26	96.06	117.86	143.26	171.83	197.23
	Min	25.27	35.56	45.09	56.13	72.01	95.81	117.48	142.88	171.32	196.72

14.2 'X' Design Casings

14.2.1 'X' Design Flush Coupled Casings — Casing Tube

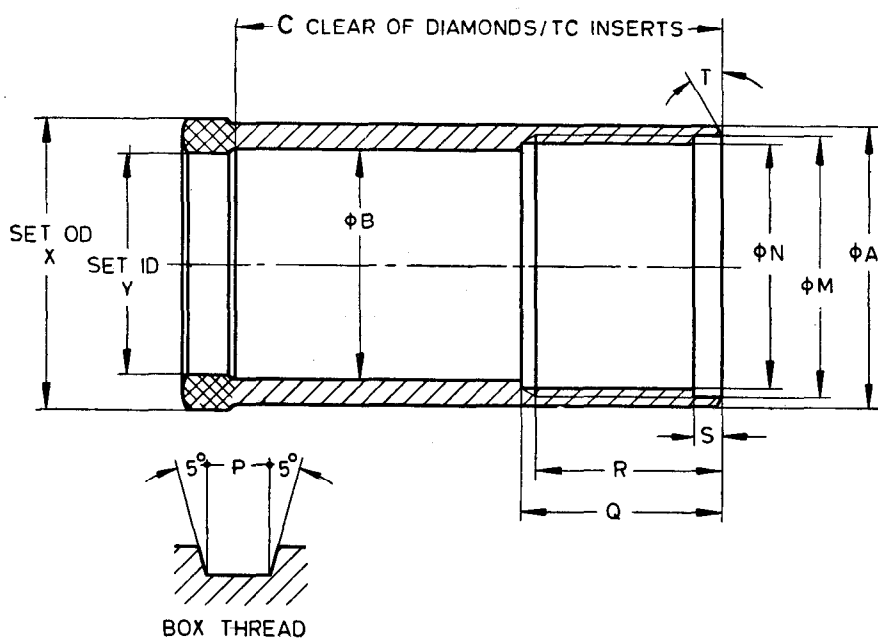


Note — Dimensions shown apply to both ends.

All dimensions in millimetres

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	Max	36·63	46·28	57·40	73·28	89·28	114·68	140·74	169·55	195·12	220·73
	Min	36·50	46·02	57·15	73·03	88·90	114·30	138·66	167·00	192·23	217·42
B	Max	30·48	41·28	50·80	65·07	80·95	104·78	130·51	158·80	184·00	208·99
	Min	30·23	41·02	50·55	64·82	80·57	104·39	125·30	151·21	175·79	203·00
C	Max	2 946·76	2 964·19	2 926·54	2 914·81	2 914·81	2 902·72	2 900·94	2 888·19	2 875·74	2 862·48
	Min	2 945·24	2 962·66	2 925·02	2 913·28	2 913·28	2 901·19	2 899·42	2 886·67	2 874·02	2 860·96
M	Max	34·32	43·71	54·05	68·33	84·20	108·48	133·65	162·03	187·76	212·75
	Min	34·26	43·66	54·00	68·28	84·14	108·38	133·53	161·85	187·58	212·57
N	Max	32·79	42·14	52·45	65·94	81·81	106·05	131·24	159·56	184·81	209·80
	Min	32·74	42·09	52·40	65·89	81·76	105·97	131·14	159·46	184·68	209·68
Thread pitch		3·175	3·175	3·175	3·175	3·175	5·080	5·080	5·080	6·350	6·350
P	Max	1·63	1·63	1·63	1·60	1·60	2·59	2·57	2·57	3·18	3·18
	Min	1·55	1·55	1·55	1·52	1·52	2·51	2·51	2·46	3·07	3·07
Q	Max	25·90	51·30	57·65	60·83	67·18	64·00	70·35	76·70	83·05	89·48
	Min	25·40	50·80	57·15	60·33	66·68	63·50	69·85	76·20	82·55	88·98
R	Max	24·30	48·13	54·48	57·65	64·00	57·65	67·18	73·33	79·88	86·23
	Min	23·80	47·63	53·98	57·15	63·50	57·15	66·68	73·03	79·38	85·73
S	Max	3·43	6·60	6·60	6·60	6·60	8·13	9·78	9·78	9·78	9·78
	Min	2·92	6·10	6·10	6·10	6·10	7·62	9·27	9·27	9·27	9·27
T		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
V		—	—	does not apply		—	—	30°	30°	30°	30°

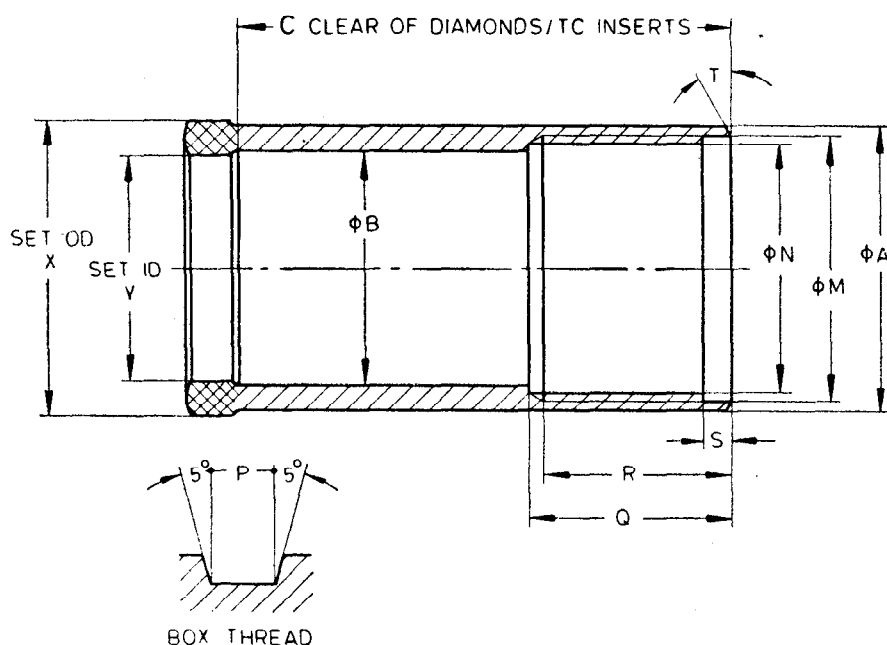
14.2.2 'X' Design Flush Coupled Casings — Casing Shoe Bit



All dimensions in millimetres

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	Max	36.98	46.53	58.34	73.96	90.47	115.93	141.33	169.90	195.30	220.70
	Min	36.88	46.43	58.24	73.86	90.37	115.82	141.17	169.75	195.07	220.47
B	Max	30.73	38.61	48.92	60.83	76.96	100.84	122.86	148.26	177.22	202.62
	Min	30.23	38.10	48.41	60.33	76.20	100.08	122.10	147.50	176.20	201.60
C	Min	63.50	88.90	95.25	104.78	111.13	114.30	133.35	146.05	152.40	158.75
M	Max	34.32	43.71	54.05	68.33	84.20	108.48	133.65	162.03	187.76	212.75
	Min	34.26	43.66	54.00	68.28	84.15	108.38	133.53	161.85	187.58	212.57
N	Max	32.79	42.14	52.45	65.94	81.81	106.05	131.24	159.56	184.81	209.80
	Min	32.74	42.09	52.40	65.89	81.76	105.97	131.14	159.46	184.68	209.68
Thread pitch		3.175	3.175	3.175	3.175	3.175	5.080	5.080	5.080	6.350	6.350
P	Max	1.63	1.63	1.63	1.60	1.60	2.59	2.57	2.57	3.18	3.18
	Min	1.55	1.55	1.55	1.52	1.52	2.51	2.46	2.46	3.07	3.07
Q	Max	25.90	51.30	57.65	60.83	67.18	64.00	70.35	76.70	83.05	80.40
	Min	25.40	50.80	57.15	60.33	66.68	63.50	69.85	76.20	82.55	88.90
R	Max	24.30	48.13	54.18	57.65	64.00	57.65	67.18	73.53	79.88	86.23
	Min	23.80	47.63	53.98	57.15	63.50	57.15	66.68	73.03	79.38	85.13
S	Max	3.43	6.60	6.60	6.60	6.60	8.13	9.78	9.78	9.78	9.78
	Min	2.92	6.10	6.10	6.10	6.10	7.62	9.27	9.27	9.27	9.27
T		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
X	Max	37.85	47.75	59.69	75.44	91.95	117.65	143.76	172.72	198.50	224.16
	Min	37.59	47.50	59.44	75.18	91.69	117.27	143.26	172.21	197.74	223.39
Y	Max	30.18	38.02	48.31	60.25	76.12	99.82	121.54	146.94	175.64	201.04
	Min	30.05	37.90	48.18	60.12	75.87	99.57	121.16	146.56	175.13	200.53

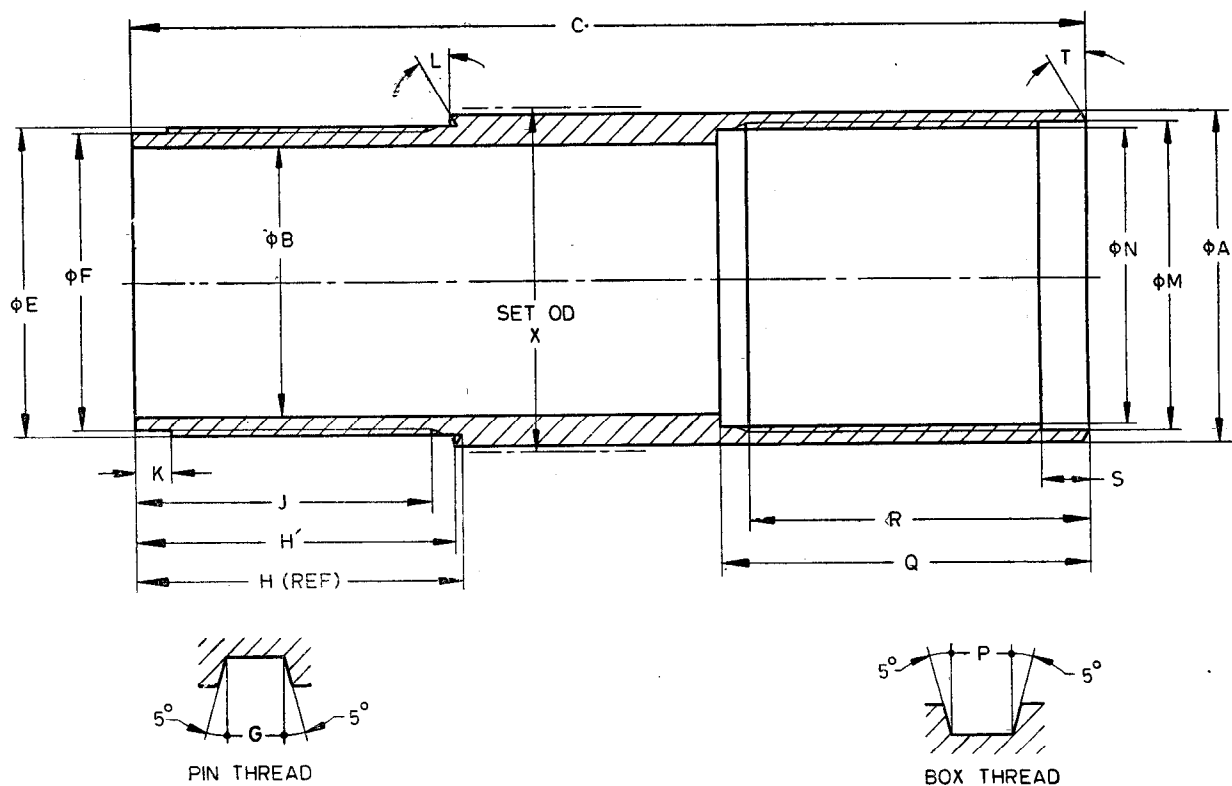
14.2.3 'X' Design Flush Coupled Casings — Casing Bit



All dimensions in millimetres

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	Max	36.98	46.53	58.34	73.96	90.47	115.93	141.33	169.90	195.30	220.70
	Min	36.88	46.43	58.24	73.86	90.37	115.82	141.17	169.75	195.07	220.47
B	Max	26.54	37.21	46.74	57.86	73.74	98.35	120.65	146.05	175.13	200.53
	Min	26.04	36.45	45.97	57.10	72.97	97.33	119.38	144.78	173.61	199.01
C	Min	63.50	88.90	95.25	104.78	111.13	114.30	133.35	146.05	152.40	158.75
M	Max	34.32	43.71	54.05	68.33	84.20	108.48	133.65	162.03	187.76	212.75
	Min	34.26	43.66	54.00	68.28	84.15	108.38	133.53	161.85	187.58	212.57
N	Max	32.79	42.14	52.45	65.94	81.81	106.05	131.24	159.56	184.81	209.80
	Min	32.74	42.09	52.40	65.89	81.76	105.97	131.14	159.46	184.68	209.68
Thread pitch		3.175	3.175	3.175	3.175	3.175	5.080	5.080	5.350	3.350	6.350
P	Max	1.63	1.63	1.63	1.60	1.60	2.59	2.57	2.57	3.18	3.18
	Min	1.55	1.55	1.55	1.52	1.52	2.51	2.46	2.46	3.07	3.07
Q	Max	25.90	51.30	57.65	60.83	67.18	64.00	70.35	76.70	83.05	89.40
	Min	25.40	50.80	57.15	60.33	66.68	63.50	69.85	76.20	82.55	88.90
R	Max	24.30	48.13	54.48	57.65	64.00	57.65	67.18	73.53	79.88	86.23
	Min	23.80	47.63	53.98	57.15	63.50	57.15	66.68	73.03	79.38	85.73
S	Max	3.43	6.60	6.60	6.60	6.60	8.13	9.78	9.78	9.78	9.78
	Min	2.92	6.10	6.10	6.10	6.10	7.62	9.27	9.27	9.27	9.27
T		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
X	Max	37.85	47.75	59.69	75.44	91.95	117.65	143.76	172.72	198.50	224.16
	Min	37.59	47.50	59.44	75.18	91.69	117.27	143.26	172.21	197.74	223.39
Y	Max	25.53	35.81	45.34	56.39	72.26	96.06	117.86	143.26	171.83	197.23
	Min	25.27	35.56	45.09	56.13	72.01	95.81	117.48	142.88	171.32	196.72

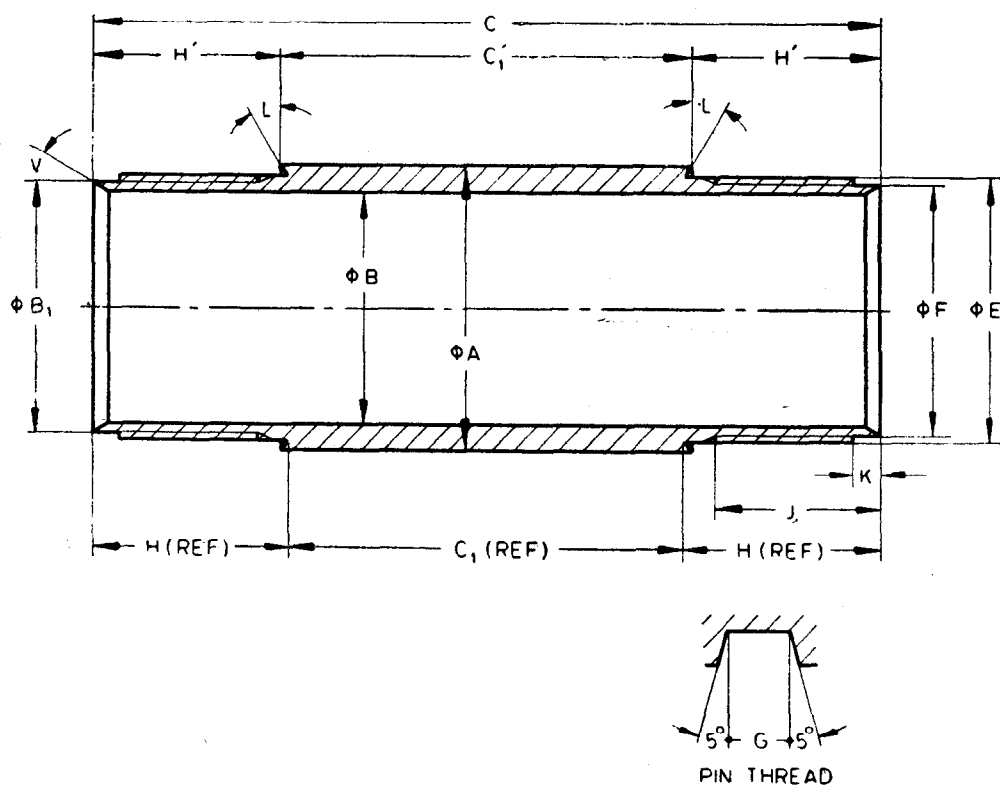
14.2.4 'X' Design Flush Coupled Casings — Reaming Shell



All dimensions in millimetres

Dimension		EX	AX	BX	NX
A	Max	46.53	58.34	73.96	90.47
	Min	46.43	58.24	73.86	90.37
B	Max	38.35	48.67	60.58	76.58
	Min	38.10	48.41	60.33	76.20
C	Min	133.35	146.05	158.75	171.45
E	Max	43.61	53.95	68.22	84.10
	Min	43.56	53.90	68.17	84.05
F	Max	42.04	52.35	65.84	81.71
	Min	41.91	52.22	65.71	81.58
Thread pitch		3.175	3.175	3.175	3.175
G	Max	1.63	1.63	1.60	1.60
	Min	1.55	1.55	1.52	1.52
H	Max	45.47	52.07	55.75	61.98
	Min	44.96	51.56	55.24	61.47
H'	Max	44.63	50.81	54.10	60.15
	Min	44.12	50.30	53.59	59.64
J	Min	41.28	47.63	50.80	57.15
K	Max	5.03	5.03	5.03	5.03
	Min	4.52	4.52	4.52	4.52
L		30°	30°	30°	30°
M	Max	43.71	54.05	68.33	84.20
	Min	43.66	54.00	68.28	84.15
N	Max	42.14	52.45	65.94	81.81
	Min	42.09	52.40	65.89	81.76
Thread pitch		3.175	3.175	3.175	3.175
P	Max	1.63	1.63	1.60	1.60
	Min	1.55	1.55	1.52	1.52
Q	Max	51.56	57.91	61.09	67.44
	Min	50.80	57.15	60.33	66.68
R	Max	48.13	54.48	57.65	64.00
	Min	47.63	53.98	57.15	63.50
S	Max	6.60	6.60	6.60	6.60
	Min	6.10	6.10	6.10	6.10
T		30°	30°	30°	30°
X	Max	48.13	60.07	75.82	92.33
	Min	47.88	59.82	75.57	92.08

14.2.5 'X' Design Flush Coupled Casings — Casing Coupling



Note — Dimensions shown apply to both ends.

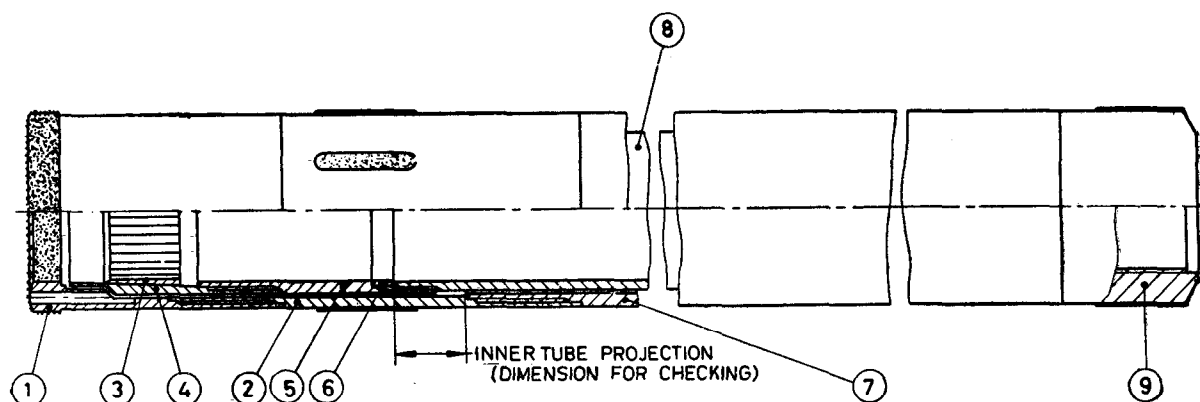
All dimensions in millimetres

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	Max	36·63	46·28	57·40	73·28	89·28	114·68	140·74	169·55	195·12	220·73
	Min	36·50	46·02	57·15	73·03	88·90	114·30	138·66	167·01	192·23	217·42
B	Max	30·48	38·35	48·67	60·58	76·58	100·38	127·38	152·45	179·20	205·94
	Min	30·23	38·10	48·41	60·33	76·20	100·00	122·30	147·70	176·20	201·60
B ₁	Max	30·48	40·39	50·67	64·14	80·01	104·27	129·41	157·73	182·88	207·90
	Min	30·23	39·75	50·04	63·50	79·38	103·63	128·78	157·10	182·25	207·26
C		101·60	127·00	177·80	196·85	209·55	215·90	228·60	254·00	279·40	304·80
C ₁	Max	54·25	36·83	74·47	86·21	86·21	98·30	100·08	112·83	125·48	138·53
	Min	53·75	36·32	73·96	85·70	85·70	97·79	99·57	112·32	124·97	138·02
C ₁ '	Max	54·25	38·31	76·40	89·07	88·10	101·89	101·76	114·60	127·77	140·33
	Min	53·75	37·80	75·90	88·56	88·59	101·38	101·25	114·09	126·66	139·82
E	Max	34·21	43·61	53·95	68·22	84·10	108·31	133·45	161·75	187·45	212·45
	Min	34·16	43·56	53·90	68·17	84·05	108·23	133·38	161·62	187·33	212·32
F	Max	32·69	42·04	52·35	65·84	81·71	105·89	131·06	159·36	184·56	209·55
	Min	32·56	41·91	52·22	65·71	81·58	105·77	130·96	159·26	184·43	209·42
Thread pitch		3·175	3·175	3·175	3·175	3·175	5·080	5·080	5·080	6·350	6·350
G	Max	1·63	1·63	1·63	1·60	1·60	2·59	2·57	2·57	3·18	3·18
	Min	1·55	1·55	1·55	1·52	1·52	2·51	2·46	2·46	3·07	3·07
H	Max	24·05	45·47	52·07	55·75	61·98	59·18	64·64	70·97	77·32	83·52
	Min	23·55	44·96	51·56	55·25	61·47	58·67	64·14	70·46	76·81	83·01
H'	Max	24·05	44·73	51·10	54·32	60·53	57·38	63·80	70·09	76·48	82·62
	Min	23·55	44·22	50·69	53·82	60·02	56·87	63·30	69·58	75·97	82·11
J	Min	22·22	41·28	47·62	50·80	57·15	53·98	60·33	66·68	73·03	79·38
K	Max	3·43	5·03	5·03	5·03	5·03	5·03	5·03	5·03	5·03	5·03
	Min	2·92	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52	4·52
L		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
V		0	30	30	30	30	30	30	30	30	30

SECTION 3 CORE BARRELS — 'WF' DESIGN

15. 'WF' Design Double Tube Core Barrel (for BWF and NWF)

15.1 *Nomenclature* — A typical assembly of double tube core barrel of BWF and NWF sizes is shown below indicating the dimensions for checking:



Reference Number	Description
1	Core bit
2	Reaming shell
3	Core lifter
4	Core lifter case
5	Inner tube extension
6	Inner tube extension spacer
7	Outer tube
8	Inner tube
9	Head

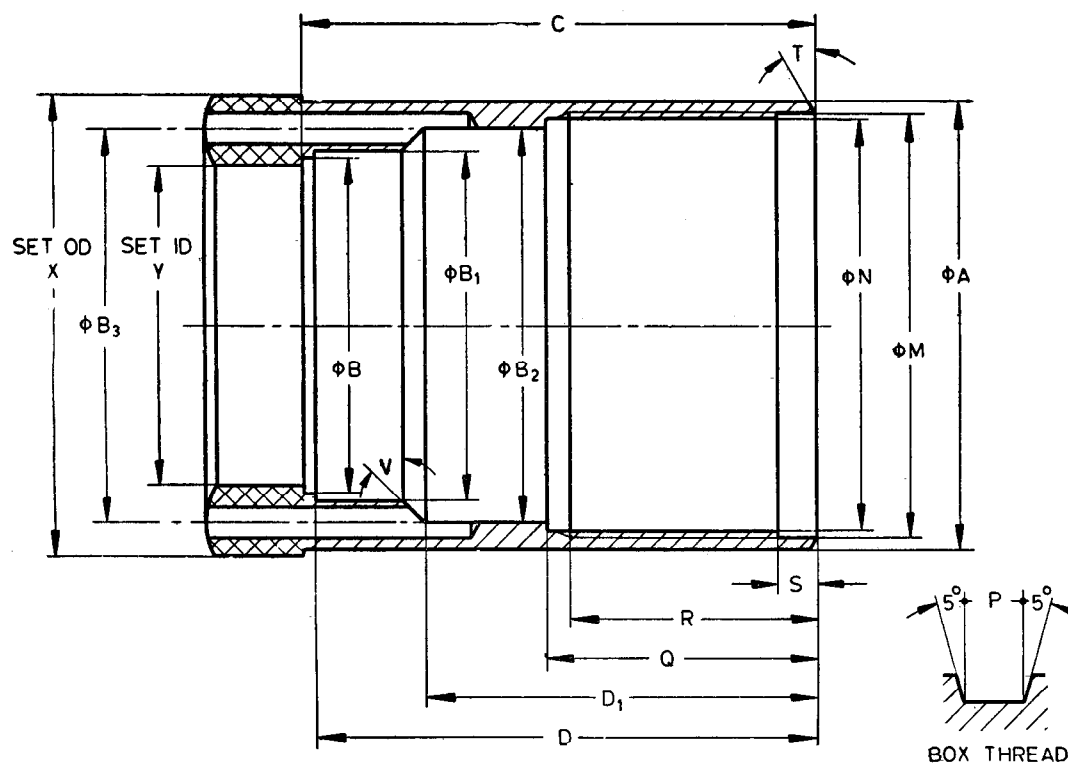
All dimensions in millimetres

Dimensions for Checking		BWF	NWF
	Max	21·36	21·36
	Min	19·13	19·13

15.1.1 WF design core barrel shall have lengths of 1 500 mm and 3 000 mm (lengths refer to minimum core capacity).

15.2 Detailed Dimensions

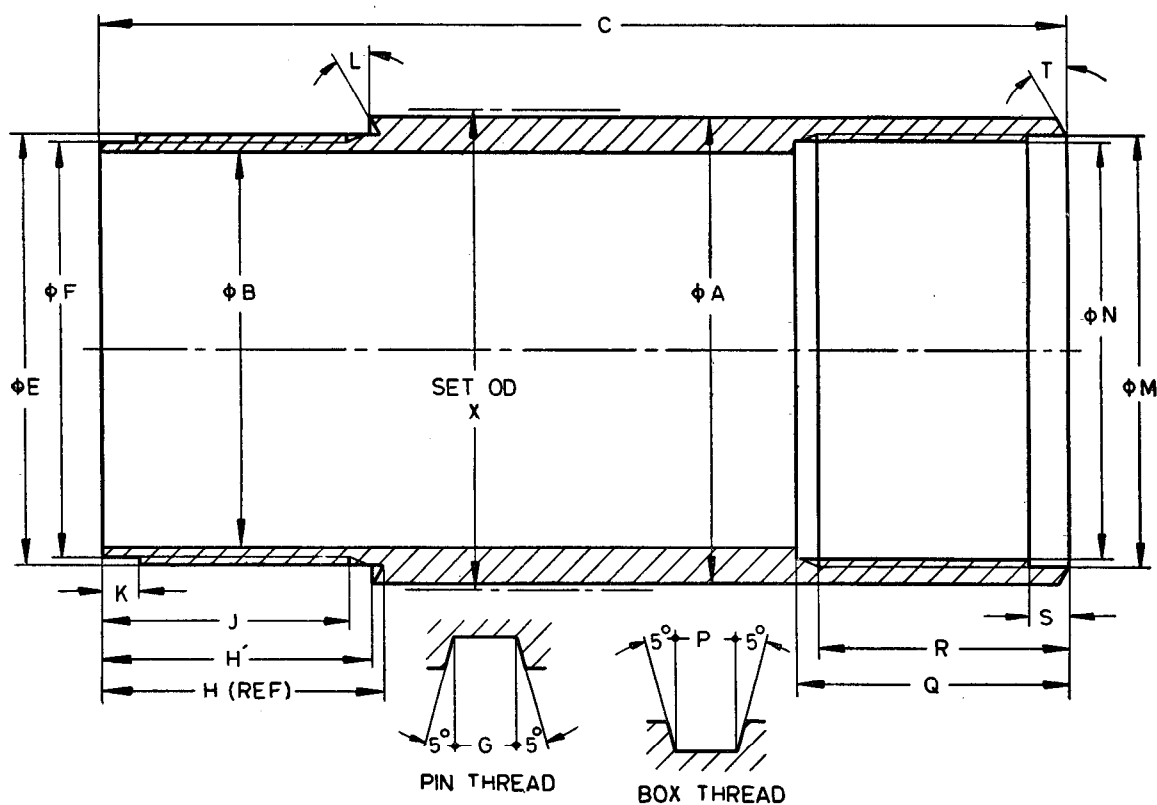
15.2.1 'WF' Design Double Tube Core Barrel — Core Bit



All dimensions in millimetres

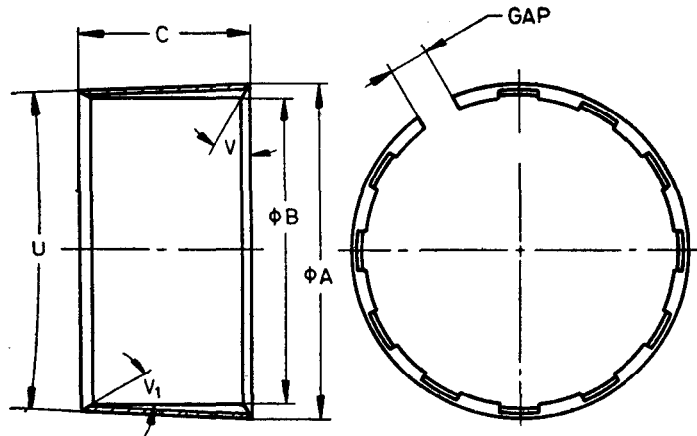
Dimension		BWF	NWF
A	Max	58·60	74·27
	Min	58·50	74·17
B	Max	44·07	6·77
	Min	43·69	56·39
B ₁	Max	45·97	59·31
	Min	45·85	59·18
B ₂	Max	51·56	67·56
	Min	51·44	67·44
B ₃	Max	51·56	65·79
	Min	51·41	65·53
Hole Diameter		3·96	4·75
C	Max	67·06	76·58
	Min	66·29	75·82
D	Max	65·53	75·06
	Min	64·77	74·30
D ₁	Max	51·18	59·44
	Min	50·80	59·06
M	Max	55·55	71·43
	Min	55·47	71·35
N	Max	54·25	70·13
	Min	54·20	70·08
Thread pitch		3·175	3·175
P	Max	1·63	1·63
	Min	1·55	1·55
Q	Max	35·05	38·23
	Min	34·92	38·10
R	Max	32·25	35·42
	Min	31·75	34·92
S	Max	5·00	5·00
	Min	4·50	4·50
T		15°	15°
V		45°	45°
X	Max	59·69	75·44
	Min	59·44	75·18
Y	Max	42·16	54·86
	Min	41·91	54·61

15.2.2 'WF' Design Double Tube Core Barrel — Reaming Shell



All dimensions in millimetres

Dimension		BWF	NWF
A	Max	58·93	74·55
	Min	58·83	74·45
B	Max	51·23	67·06
	Min	51·10	66·93
C	Max	123·95	140·08
	Min	123·19	139·32
E	Max	55·42	71·30
	Min	55·37	71·25
F	Max	54·15	70·03
	Min	54·08	69·95
Thread pitch		3·175	3·175
G	Max	1·63	1·63
	Min	1·55	1·55
H	Max	34·92	38·10
	Min	34·80	37·97
H'	Max	34·45	37·67
	Min	34·33	37·54
J	Min	31·75	34·92
K	Max	5·00	5·00
	Min	4·00	4·50
L		15°	15°
M	Max	55·85	71·73
	Min	55·78	71·65
N	Max	54·25	70·13
	Min	54·20	70·08
Thread pitch		3·175	3·175
P	Max	1·63	1·63
	Min	1·55	1·55
Q	Max	35·05	38·23
	Min	34·92	38·10
R	Max	32·25	35·42
	Min	31·75	34·92
S	Max	5·00	5·00
	Min	4·50	4·50
T		15°	15°
X	Max	60·07	75·82
	Min	59·82	75·56

15.2.3 'WF' Design Double Tube Core Barrel — Core Lifter

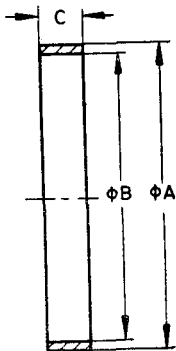
Note 1 — Width of gap, entry angle and number of flutes are at the discretion of manufacturer.

Note 2 — Core barrels with external flutes, if required by purchaser, shall conform to dimensions specified in this clause.

All dimensions in millimetres

Dimension		BWF*	NWF*
A	Max	45·03	60·91
	Min	44·93	60·81
B	Max	41·53	54·23
	Min	41·43	54·13
C	Max	22·61	35·31
	Min	21·84	34·54
U	Max	5° 15'	5° 15'
	Min	4° 45'	4° 45'
V		0°	0°
V ₁		Optional	

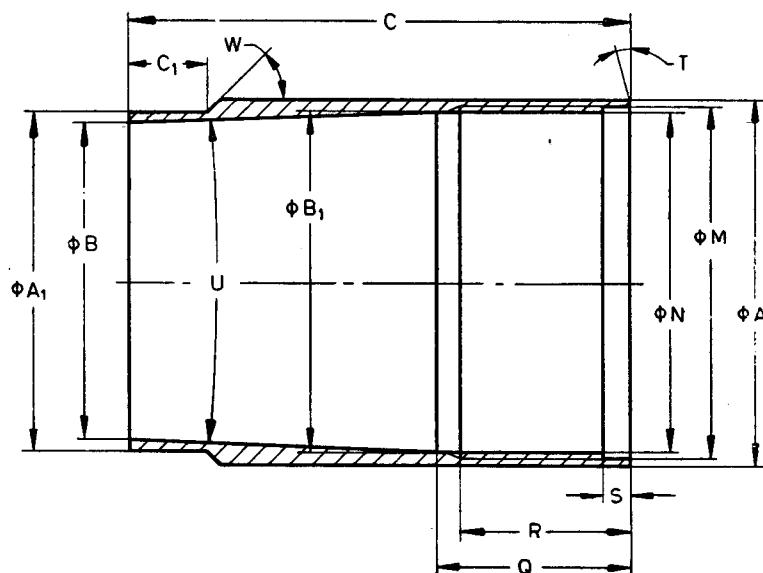
*These items are interchangeable with 'WM' design core barrels.

15.2.4 'WF' Design Double Tube Core Barrel — Inner Tube Extension Spacer

All dimensions in millimetres

Dimension		BWF	NWF
A	Max	46·05	61·93
	Min	45·97	61·85
B	Max	43·43	56·26
	Min	43·31	56·01
C	Max	6·48	6·48
	Min	6·22	6·22

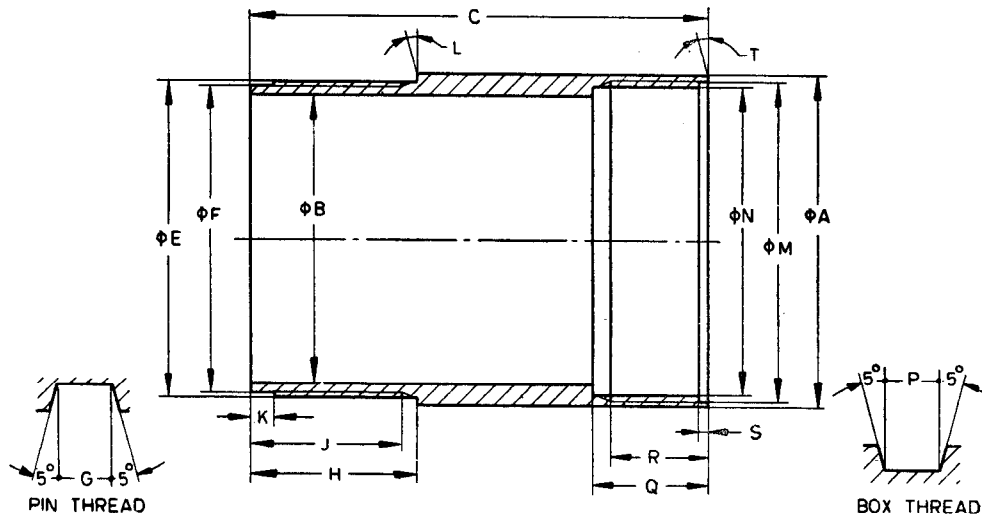
15.2.5 'WF' Design Double Tube Core Barrel — Core Lifter Case



All dimensions in millimetres

Dimension		BWF	NWF
A	Max	49.53	65.35
	Min	49.45	65.28
A ₁	Max	45.72	59.06
	Min	45.59	58.93
B	Max	43.18	50.80
C	Max	66.93	82.80
	Min	66.42	82.30
C ₁	Max	10.82	10.82
	Min	10.57	10.57
M	Max	47.42	63.35
	Min	47.35	63.27
N	Max	46.13	62.00
	Min	46.08	61.95
Thread pitch		3.175	3.175
P	Max	1.65	1.65
	Min	1.57	1.57
Q	Max	25.78	28.70
	Min	25.02	28.19
R	Max	22.72	25.90
	Min	22.22	25.40
S	Max	3.43	3.43
	Min	2.92	2.92
T		0°	0°
U	Max	5°15'	5°15'
	Min	5°0'	5°0'
W		45°	45°
B ₁	Max	46.13	62.00
	Min	46.05	61.93

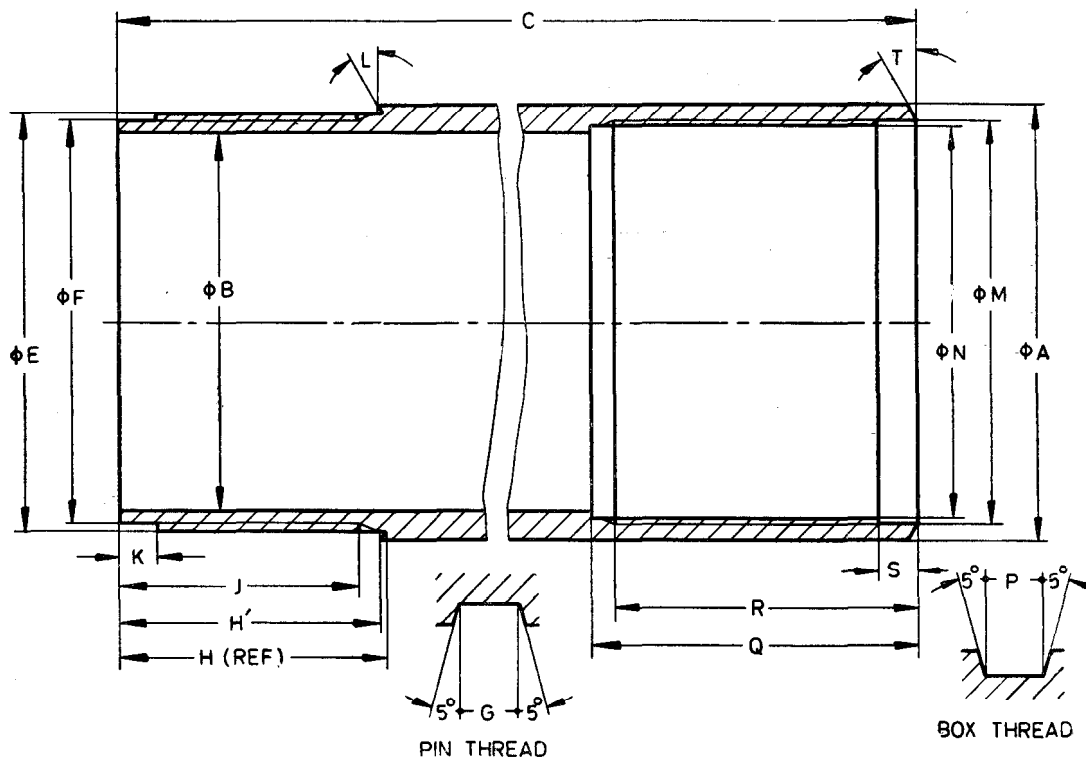
15.2.6 'WF' Design Double Tube Core Barrel — Inner Tube Extension



All dimensions in millimetres

Dimension		BWF	NWF
A	Max	49·53	65·35
	Min	49·45	65·28
B	Max	43·31	56·01
	Min	43·18	55·88
C	Max	68·83	78·36
	Min	68·20	77·72
E	Max	47·29	63·22
	Min	47·24	63·17
F	Max	46·02	61·90
	Min	45·95	61·82
Thread pitch		3·175	3·175
G	Max	1·65	1·65
	Min	1·57	1·57
H	Max	25·02	28·19
	Min	24·76	27·94
J	Min	22·86	26·04
K	Max	3·56	3·56
	Min	3·18	3·18
L		0°	0°
M	Max	47·73	63·60
	Min	47·65	63·53
N	Max	46·10	61·98
	Min	46·05	61·93
Thread pitch		3·175	3·175
P	Max	1·63	1·63
	Min	1·55	1·55
Q	Max	17·32	22·10
	Min	17·07	21·84
R	Max	14·47	16·76
	Min	13·97	16·26
S	Max	1·70	1·70
	Min	1·45	1·45
T		0°	0°

15.2.7 'WF' Design Double Tube Core Barrel — Outer Tube

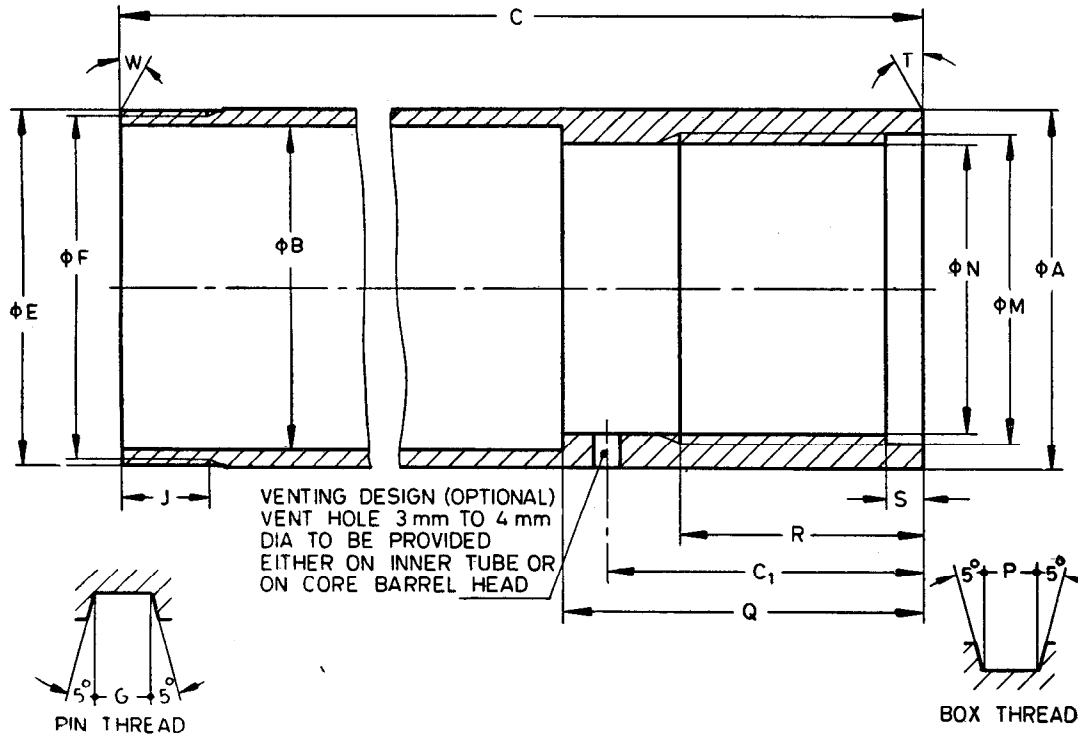


All dimensions in millimetres

Dimension		BWF*	NWF*
A	Max	58·19	74·07
	Min	57·94	73·81
B	Max	50·80	66·68
	Min	50·55	66·42
C	Max	3 245·99	3 255·52
	Min	3 245·21	3 254·73
E	Max	55·73	71·60
	Min	55·68	71·65
F	Max	54·15	70·03
	Min	54·05	69·93
Thread pitch		3·175	3·175
G	Max	1·63	1·63
	Min	1·55	1·55
H	Max	34·92	38·10
	Min	34·80	37·97
H'	Max	34·60	37·78
	Min	34·48	37·65
J	Min	31·75	34·92
K	Max	5·00	5·00
	Min	4·50	4·50
L	Min	15°	15°
M	Max	54·05	69·93
	Min	54·00	69·88
N	Max	52·45	68·33
	Min	52·40	68·28
Thread pitch		3·175	3·175
P	Max	1·63	1·63
	Min	1·55	1·55
Q	Max	43·35	49·70
	Min	42·85	49·20
R	Max	40·17	46·52
	Min	39·67	46·02
S	Max	5·00	5·00
	Min	4·50	4·50
T		30°	30°

*These items are interchangeable with the 'WG' design core barrels.

15.2.8 'WF' Design Double Tube Core Barrel — Inner Tube



Note 1 — Dimension C_1 is applicable only if vent hole is provided on inner tube.

Note 2 — Top end of inner tube need not be integral. Method of manufacture optional.

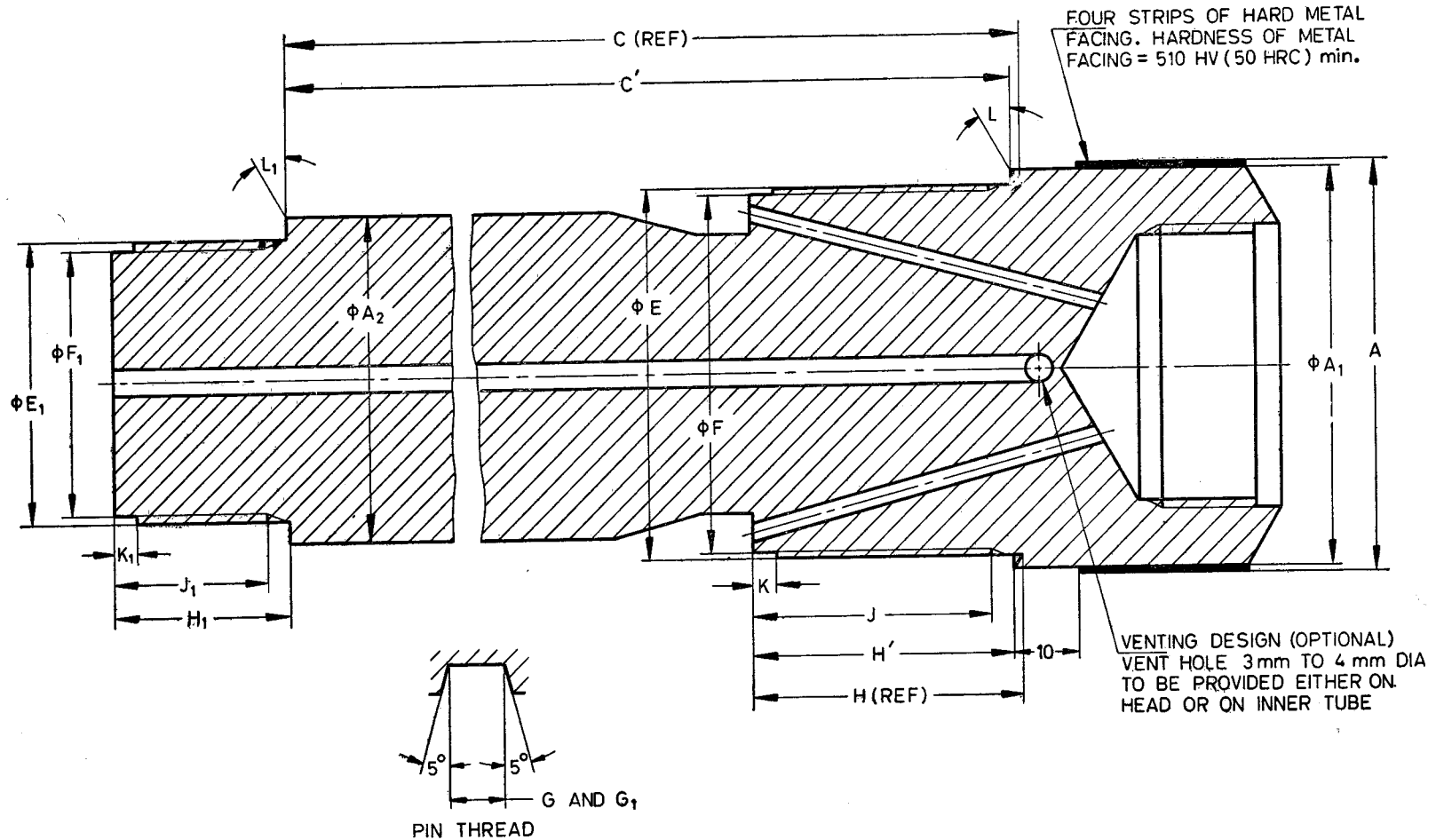
All dimensions in millimetres

Dimension		BWF*	NWF*
A	Max	47.88	63.75
	Min	47.62	63.50
B	Max	43.64	57.15
	Min	43.38	56.90
C	Max	3 096.01	3 105.53
	Min	3 095.22	3 104.74
C_1	Max	42.04	51.56
	Min	40.51	50.04
E	Max	47.60	63.47
	Min	47.55	63.42
F	Max	46.00	61.87
	Max	45.87	61.75
Thread pitch		3.175	3.175
G	Max	1.63	1.63
	Min	1.55	1.55
J	Max	11.23	16.00
	Min	10.97	15.75
M	Max	41.35	57.23
	Min	41.30	57.18
N	Max	38.96	54.84
	Min	38.91	54.79
Thread pitch		3.175	3.175
P	Max	1.63	1.63
	Min	1.55	1.55
Q	Max	48.01	57.53
	Min	47.24	56.77
R	Max	32.25	32.25
	Min	31.75	31.75
S	Max	5.00	5.00
	Min	4.50	4.50
T		0°	0°
W		0°	0°

*These items are interchangeable with the 'WM' design core barrels.

15.2.9 'WF' Design Double Tube Core Barrel — Head

IS : 10208 - 1982



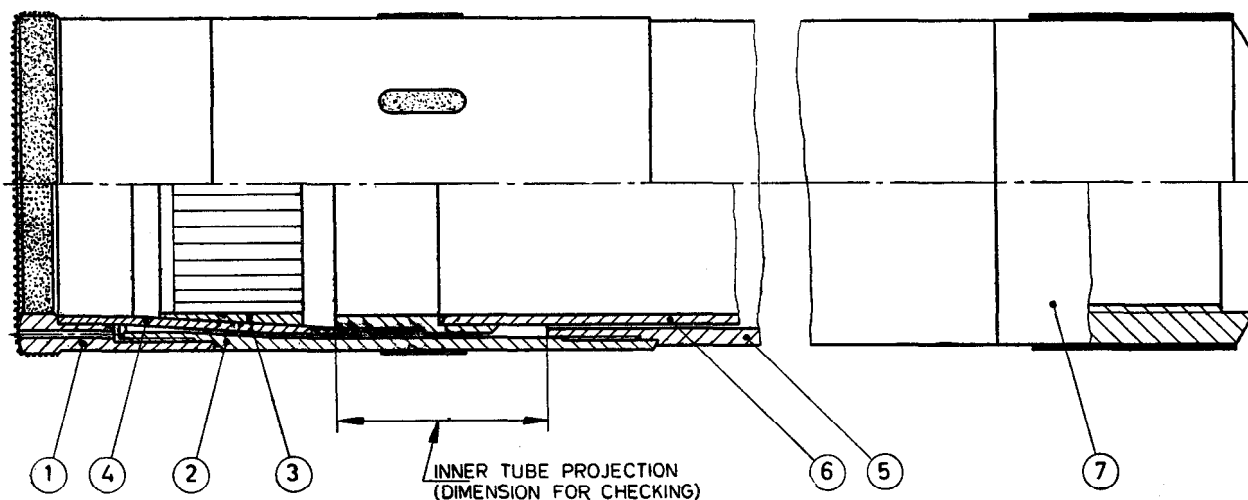
Note — The hardness of metal facing in HRC is approximate value.

All dimensions in millimetres

Dimension		BWF*	NWF*
A	Max	58.93	74.55
	Min	58.81	74.43
A ₁	Max	58.06	73.94
	Min	57.81	73.69
A ₂	Max	47.88	63.75
	Min	47.62	63.50
C	Max	170.54	170.54
	Min	169.90	169.90
C'	Max	169.38	169.38
	Min	168.74	168.74
E	Max	53.95	69.82
	Min	53.90	69.77
F	Max	52.35	68.22
	Min	52.22	68.10
Thread pitch		3.175	3.175
G	Max	1.63	1.63
	Min	1.55	1.55
H	Max	39.27	45.62
	Min	38.89	45.24
H'	Max	38.11	44.46
	Min	37.73	44.08
J	Min	34.92	41.28
K	Max	3.43	3.43
	Min	2.92	2.92
L		30°	30°
E ₁	Max	41.25	57.12
	Min	41.20	57.07
F ₁	Max	38.86	54.74
	Min	38.74	54.61
Thread pitch		3.175	3.175
G ₁	Max	1.63	1.63
	Min	1.55	1.55
H ₁	Max	25.40	28.58
	Min	25.02	28.19
J ₁	Min	22.22	25.40
K ₁	Max	3.43	3.43
	Min	2.92	2.92
L ₁		0°	0°
Rod thread connection		BW	NW
*These items are interchangeable with the 'WM' design core barrels.			

16. 'WF' Design Double Tube Core Barrel (For HWF, PWF, SWF, UWF, and ZWF)

16.1 Nomenclature — A typical assembly of double tube core barrel of HWF, PWF, SWF, UWF and ZWF size is shown below indicating the dimensions for checking :



Ref No.	Description
1	Core bit for use with shell
or 1	Core bit without shell
2	Reaming shell
3	Core lifter
4	Core lifter case
5	Outer tube
6	Inner tube
7	Head

All dimensions in millimetres

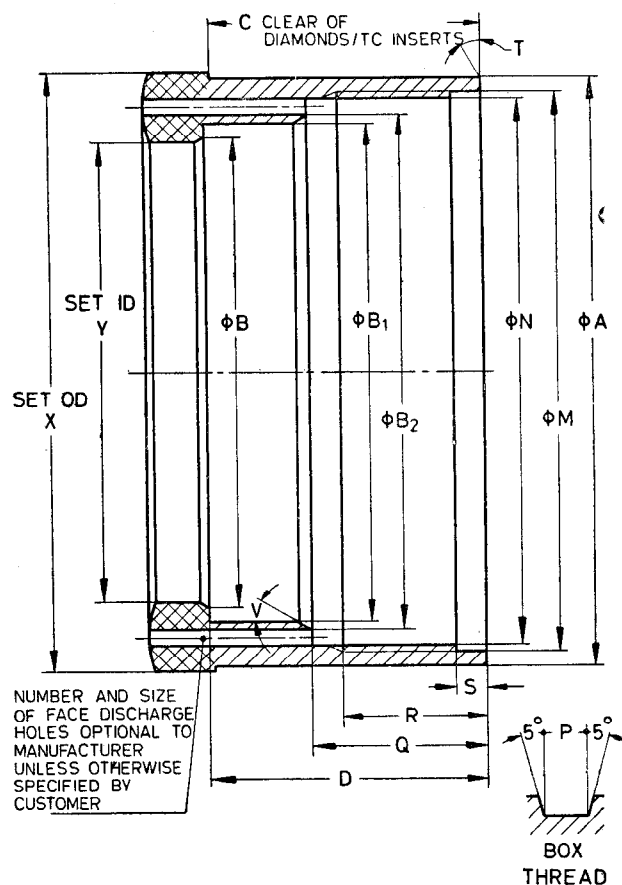
Dimensions for Checking		HWF	PWF	SWF	UWF	ZWF
	Max	61·11	83·31	86·28	86·36	86·26
	Min	59·16	80·98	83·85	83·64	83·64
Core barrel lengths (length refer to core capacity)		1 500 or 3 000				

16.1.1 Unless specified by the purchaser, blank core bit with blank reaming shell shall not be supplied with the core barrel.

16.1.2 Core bit for use with shell is to be supplied unless otherwise specified.

16.2 Detailed Dimensions

16.2.1 'WF' Design Double Tube Core Barrel — Short Core Bit

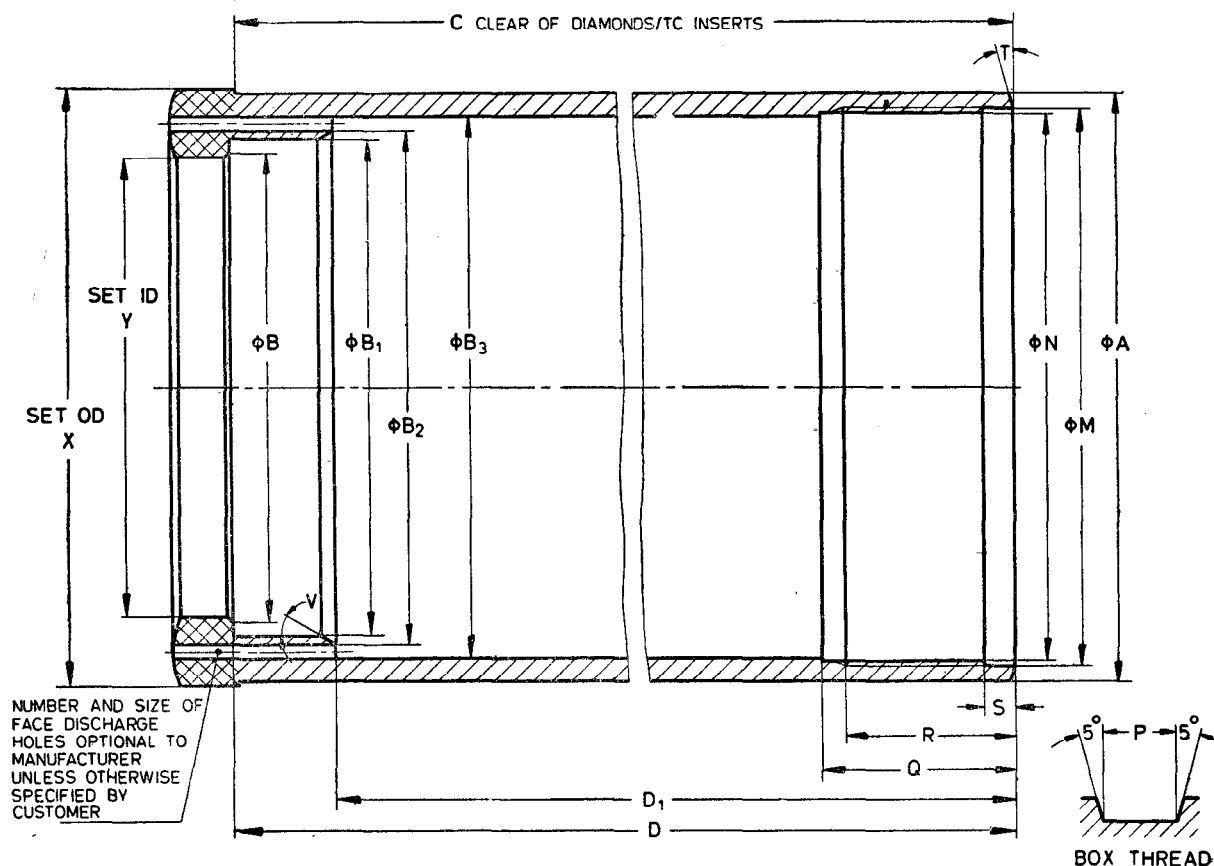


BIT DESIGN MAY INCORPORATE PROVISION FOR THE USE OF A BIT BREAKER
All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	97.59	117.50	142.75	171.32	196.72
	Min	97.49	117.37	142.62	171.20	196.60
B	Max	77.93	94.74	115.19	142.24	167.64
	Min	77.83	94.62	115.06	142.11	167.51
B ₁	Max	82.68	99.82	120.45	149.86	175.26
	Min	82.55	99.70	120.32	149.71	175.11
B ₂	Max	85.09	102.87	123.95	154.94	180.34
	Min	84.58	102.36	123.44	154.43	179.83
C	Min	44.45	53.98	53.98	53.98	53.98
	Max	45.47	54.74	54.74	54.74	54.74
D	Max	44.70	53.98	53.98	53.98	53.98
	Min	44.70	53.98	53.98	53.98	53.98
M	Max	92.56	113.46	137.69	165.74	191.14
	Min	92.48	113.36	137.59	165.61	191.01
N	Max	90.96	111.05	135.28	163.32	188.72
	Min	90.88	110.97	135.20	163.22	188.62
Thread pitch		5.080	5.080	5.080	5.080	5.080
P	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
Q	Max	28.70	41.40	41.40	41.40	41.40
	Min	28.45	41.15	41.15	41.15	41.15
R	Max	24.30	38.60	38.60	38.60	38.60
	Min	23.80	38.10	38.10	38.10	38.10
S	Max	5.00	5.00	5.00	5.00	5.00
	Min	4.50	4.50	4.50	4.50	4.50
T	Max	0°	0°	0°	0°	0°
	Min	0°	0°	0°	0°	0°
V	Max	30°	30°	30°	30°	30°
	Min	30°	30°	30°	30°	30°
X	Max	98.98	120.27	145.67	174.12	199.52
	Min	98.60	119.76	145.16	173.36	198.76
Y	Max	76.33	92.33	112.95	140.08	165.48
	Min	76.07	91.95	112.57	139.57	164.97

Note 1 — Unless specified otherwise, short core bit shall be supplied.
Note 2 — Short core bit shall be used with reaming shell.

16.2.2 'WF' Design Double Tube Core Barrel — Long Core Bit



BIT DESIGN MAY INCORPORATE PROVISION FOR THE USE OF A BIT BREAKER

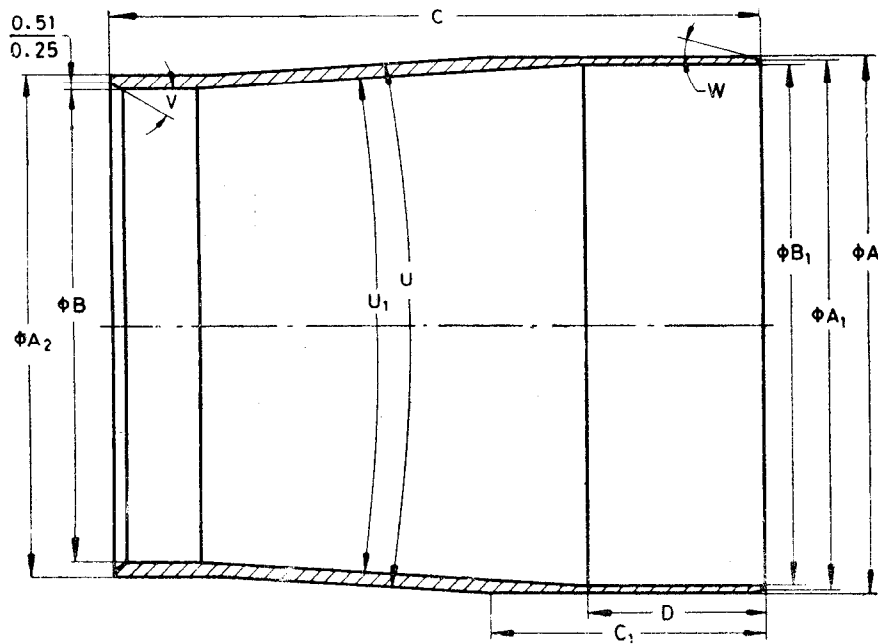
All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	97.59	117.50	142.75	171.32	196.72
	Min	97.49	117.37	142.62	171.20	196.60
B	Max	77.93	94.74	115.19	142.24	167.64
	Min	77.83	94.62	115.06	142.11	167.51
B ₁	Max	82.68	99.82	120.45	149.86	175.26
	Min	82.55	99.70	120.32	149.71	175.11
B ₂	Max	85.09	102.87	123.95	154.94	180.34
	Min	84.58	102.36	123.44	154.43	179.83
B ₃	Max	89.92	108.36	132.84	162.28	187.68
	Min	89.66	108.10	132.59	162.03	187.43
C	Max	174.75	223.01	235.71	248.41	248.41
	Min	174.62	222.63	235.33	248.03	248.03
D	Max	175.39	223.39	236.09	248.79	248.79
	Min	174.62	222.63	235.33	248.03	248.03
D ₁	Max	158.88	210.59	223.29	235.99	235.99
	Min	158.75	210.34	223.04	235.74	235.74
M	Max	92.56	111.94	136.19	165.33	190.73
	Min	92.48	111.84	136.09	165.20	190.60
N	Max	90.96	109.52	133.78	162.92	188.32
	Min	90.88	109.45	133.71	162.81	188.21
Thread pitch		5.080	5.080	5.080	5.080	5.080
P	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
Q	Max	32.23	57.40	57.40	63.75	63.75
	Min	32.11	57.15	57.15	63.50	63.50
R	Max	28.26	51.30	51.30	57.65	57.65
	Min	27.76	50.80	50.80	57.15	57.15
S	Max	5.00	5.00	5.00	5.00	5.00
	Min	4.50	4.50	4.50	4.50	4.50
T		15°	15°	15°	15°	15°
V		30°	30°	30°	30°	30°
X	Max	99.36	120.78	146.18	174.75	200.15
	Min	98.98	120.40	145.80	174.24	199.64
Y	Max	76.33	92.33	112.95	140.08	165.48
	Min	76.07	91.95	112.57	139.57	164.97

Note 1 — Long core bit to be supplied on specific order.

Note 2 — Long core bits shall be used without reaming shell.

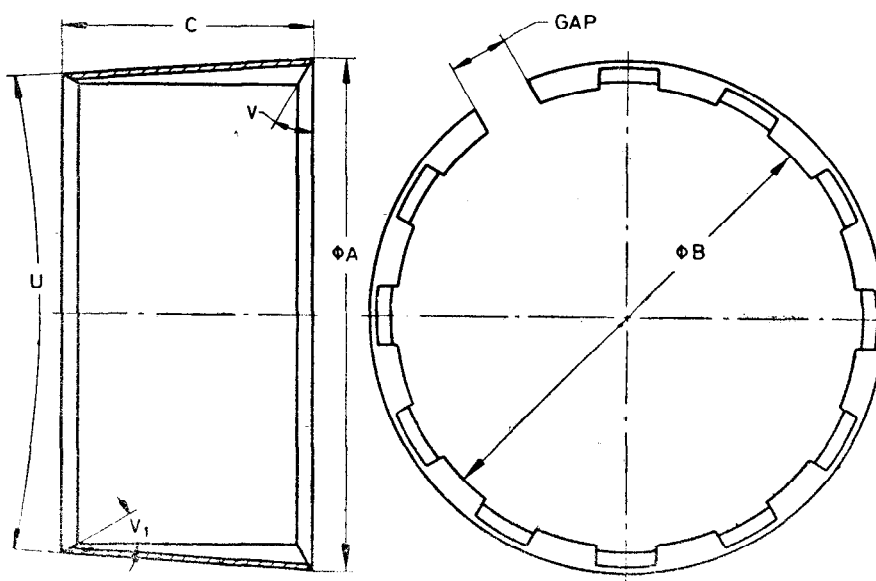
16.2.3 'WF' Design Double Tube Core Barrel — Core Lifter Case



All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	87.76	105.64	129.72	157.51	182.91
	Min	87.66	105.54	129.62	157.38	182.78
A ₁	Max	—	104.14	126.36	154.94	180.34
	Min	—	103.89	126.11	154.69	180.09
A _a	Max	82.22	99.44	120.07	149.45	174.85
	Min	82.12	99.31	119.94	149.33	174.73
B	Max	77.93	94.82	115.27	142.34	167.74
	Min	77.83	94.69	115.14	142.19	167.59
B ₁	Max	85.47	100.48	122.66	151.05	176.45
	Min	85.42	100.38	122.56	150.93	176.33
C	Max	106.35	119.05	131.75	138.10	138.10
	Min	106.17	118.87	131.57	137.92	137.92
C ₁	Max	44.70	35.18	38.35	38.35	38.35
	Min	44.20	34.67	37.85	37.85	37.85
D	Max	28.83	35.18	38.35	38.35	38.35
	Min	28.32	34.67	37.85	37.85	37.85
U	Max	7°15'	7°15'	7°15'	7°15'	7°15'
	Min	6°45'	6°45'	6°45'	6°45'	6°45'
U ₁	Max	7°15'	7°15'	7°15'	7°15'	7°15'
	Min	6°45'	6°45'	6°45'	6°45'	6°45'
V		30°	30°	30°	30°	30°
W		—	15°	15°	15°	15°

16.2.4 'WF' Design Double Tube Core Barrel — Core Lifter



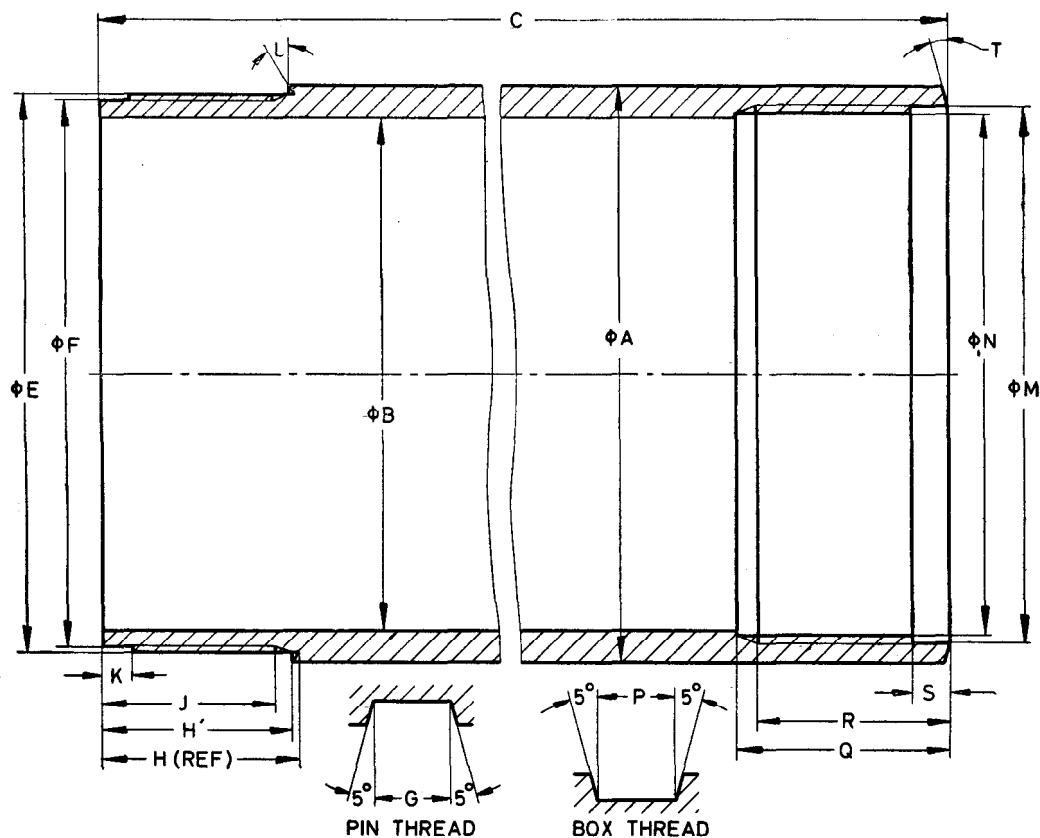
Note 1 — Width of gap, entry angle and number of flutes are at the discretion of manufacturer.

Note 2 — Core lifters with external flutes, if required by purchaser, shall conform to dimensions specified in this clause.

All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	83·97	99·31	120·90	149·30	174·70
	Min	83·87	99·16	120·75	149·10	174·50
B	Max	75·69	91·64	112·27	139·27	164·67
	Min	75·56	91·52	112·14	139·14	164·54
C	Max	41·66	41·66	48·01	54·36	54·36
	Min	40·89	40·89	47·24	53·59	53·59
U	Max	7°15'	7°15'	7°15'	7°15'	7°15'
	Min	6°45'	6°45'	6°45'	6°45'	6°45'
V		0°	0°	0°	0°	0°
V ₁		Optional				

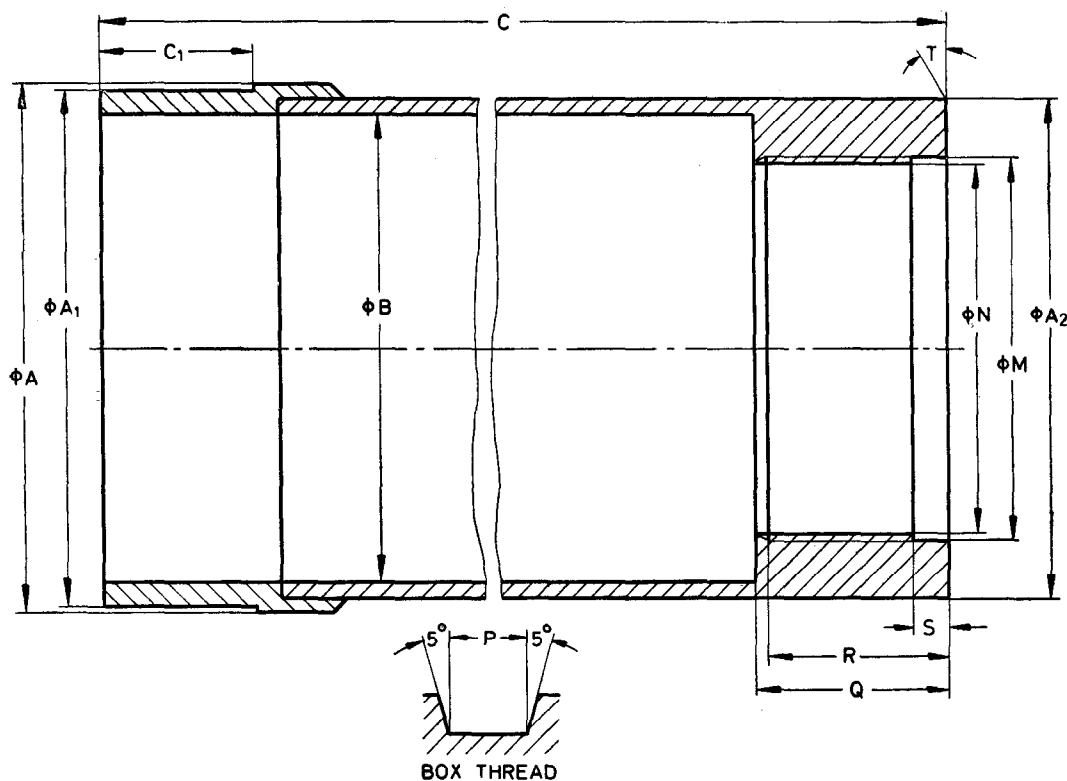
16.2.5 'WF' Design Double Tube Core Barrel — Outer Tube



All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	95.63	114.68	140.74	169.54	195.12
	Min	95.25	114.30	138.66	167.00	192.23
B	Max	85.85	105.16	128.88	155.55	180.54
	Min	85.34	104.78	125.30	151.21	175.79
C	Max	3 143.48	3 164.66	3 151.96	3 171.82	3 171.82
	Min	3 142.69	3 163.87	3 151.17	3 171.04	3 171.04
E	Max	92.41	111.76	136.02	165.10	190.50
	Min	92.33	111.68	135.94	165.00	190.40
F	Max	90.80	109.37	133.63	162.71	188.11
	Min	90.70	109.27	133.53	162.59	187.99
Thread pitch		5.080	5.080	5.080	5.080	5.080
G	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
H	Max	32.16	51.56	51.71	57.99	57.90
	Min	32.03	51.18	51.33	57.61	57.61
H'	Max	31.75	51.19	51.21	57.56	57.56
	Min	31.62	50.81	50.83	57.18	57.18
J	Max	28.58	47.62	47.62	53.98	53.98
	Min	28.58	47.62	47.62	53.98	53.98
K	Max	5.00	5.00	5.00	5.00	5.00
	Min	4.50	4.50	4.50	4.50	4.50
L		15°	15°	15°	15°	15°
M	Max	89.05	107.85	130.07	158.75	184.15
	Min	88.95	107.75	129.97	158.62	184.02
N	Max	86.64	105.44	127.66	156.34	181.74
	Min	86.56	105.36	127.58	156.24	181.64
Thread pitch		5.080	5.080	5.080	5.080	5.080
P	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
Q	Max	35.42	57.65	57.65	64.00	64.00
	Min	34.92	57.15	57.15	63.50	63.50
R	Max	32.25	51.30	51.30	57.65	57.65
	Min	31.75	50.80	50.80	57.15	57.15
S	Max	6.05	6.60	6.60	6.60	6.60
	Min	5.54	6.10	6.10	6.10	6.10
T		15°	15°	15°	15°	15°

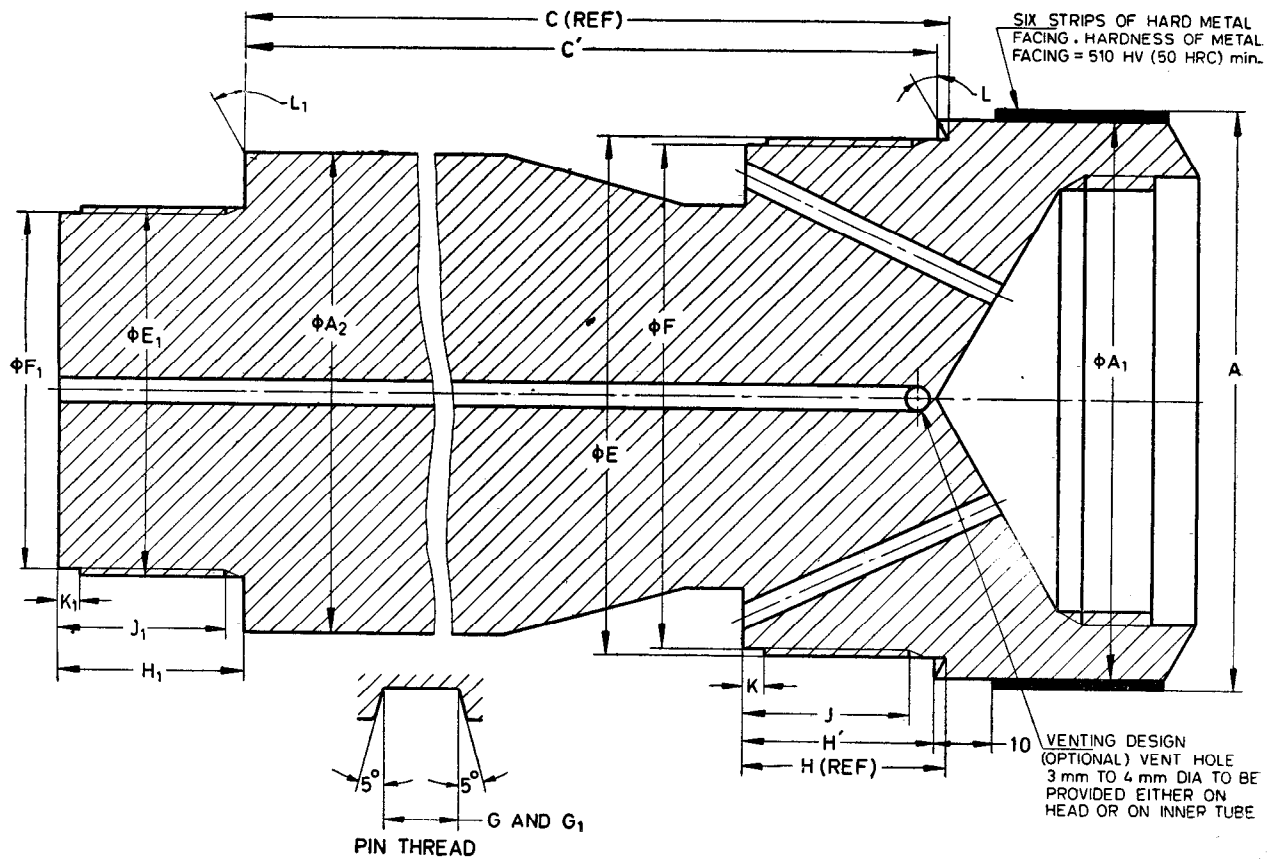
16.2.6 'WF' Design Double Tube Core Barrel — Inner Tube



All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	87·76	104·14	126·36	154·94	180·34
	Min	87·66	104·01	126·24	154·81	180·21
A ₁	Max	85·34	100·33	122·50	150·88	176·28
	Min	85·27	100·25	122·43	150·77	176·17
A ₂	Max	82·93	98·63	120·95	149·63	175·03
	Min	82·55	98·22	120·35	148·82	174·22
B	Max	77·90	93·85	114·60	143·28	168·68
	Min	77·39	93·45	114·00	142·47	167·87
C	Max	3 069·29	3 071·01	3 058·31	3 058·31	3 058·31
	Min	3 068·50	3 070·22	3 057·52	3 057·52	3 057·52
C ₁	Max	25·40	31·75	34·92	34·92	34·92
	Min	25·27	31·62	34·80	34·80	34·80
M	Max	63·65	76·35	76·35	120·85	146·25
	Min	63·55	76·25	76·25	120·73	146·13
N	Max	61·52	73·91	73·91	118·44	143·84
	Min	61·44	73·86	73·86	118·34	143·74
Thread pitch		5·08	5·08	5·08	5·08	5·08
P	Max	2·59	2·57	2·57	2·57	2·57
	Min	2·51	2·46	2·46	2·46	2·46
Q	Max	31·88	47·88	47·88	54·23	54·23
	Min	31·75	47·37	47·37	53·72	53·72
R	Max	32·25	47·87	47·87	54·22	54·22
	Min	31·75	47·37	47·37	53·72	53·72
S	Max	5·79	5·79	5·79	5·79	5·79
	Min	5·28	5·28	5·28	5·28	5·28
T		0°	0°	0°	0°	0°

16.2.7 'WF' Design Double Tube Core Barrel — Head

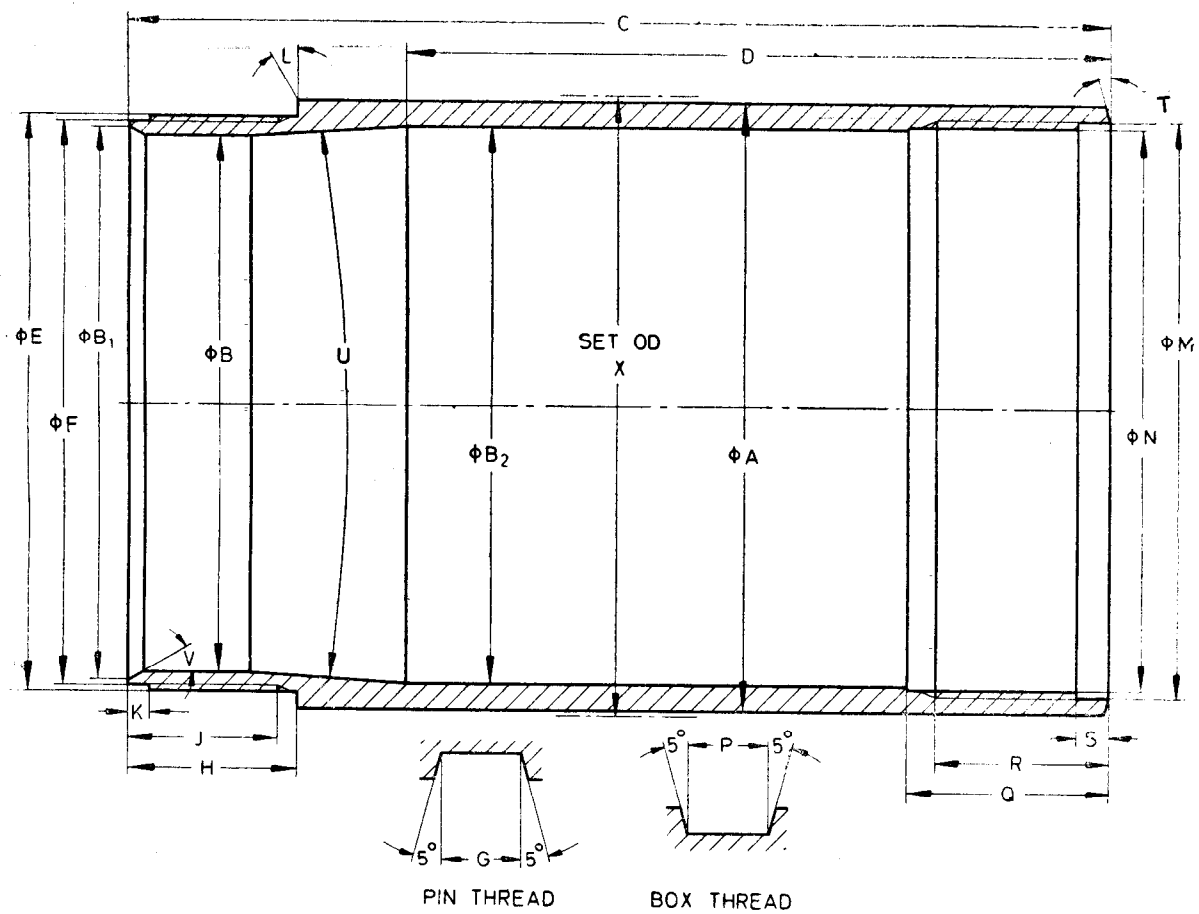


Note — Hardness of metal facing in HRC is approximate value.

All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	97.78	118.77	143.96	171.92	197.11
	Min	97.65	118.65	143.84	170.80	196.99
A ₁	Max	95.45	114.68	140.08	168.66	194.06
	Min	95.07	114.30	139.70	168.28	193.68
A ₂	Max	82.55	98.63	120.95	149.63	175.03
C	Max	134.52	176.17	179.15	199.09	199.09
	Min	134.14	175.41	178.38	197.94	197.94
C'	Max	133.66	175.25	177.81	197.75	197.75
	Min	133.28	174.49	177.64	196.60	196.60
E	Max	88.90	107.67	129.90	158.52	183.92
	Min	88.82	107.59	129.82	158.42	183.82
F	Max	86.51	105.28	127.51	156.13	181.53
	Min	86.41	105.18	127.41	156.01	181.41
Thread pitch		5.080	5.080	5.080	5.080	5.080
G	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
H	Max	32.61	51.71	51.71	58.47	58.47
	Min	32.23	51.33	51.33	58.09	58.09
H'	Max	31.75	50.79	50.37	57.13	57.13
	Min	31.37	50.41	49.99	56.75	56.75
J	Min	28.58	47.62	47.62	63.98	63.98
K	Max	3.43	5.00	5.00	5.00	5.00
	Min	2.92	4.50	4.50	4.50	4.50
L		15°	15°	15°	15°	15°
E ₁	Max	63.50	76.20	76.20	120.65	146.05
	Min	63.45	76.15	76.15	120.57	145.97
F ₁	Max	61.39	73.81	73.81	118.26	143.66
	Min	61.29	73.71	73.71	118.16	143.56
Thread pitch		5.080	5.080	5.080	5.080	5.080
G ₁	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
H ₁	Max	31.75	47.62	47.62	53.98	53.98
	Min	31.37	47.24	47.24	53.59	53.59
J ₁	Min	28.58	44.45	44.45	50.80	50.80
K ₁	Max	3.43	5.00	5.00	5.00	5.00
	Min	2.92	4.50	4.50	4.50	4.50
L ₁		0°	0°	0°	0°	0°
Drill rod connection		HW	*	*	*	*

*Threads for drill rod connection shall be according to established practices.

16.2.8 'WF' Design Double Tube Core Barrel — Reaming Shell

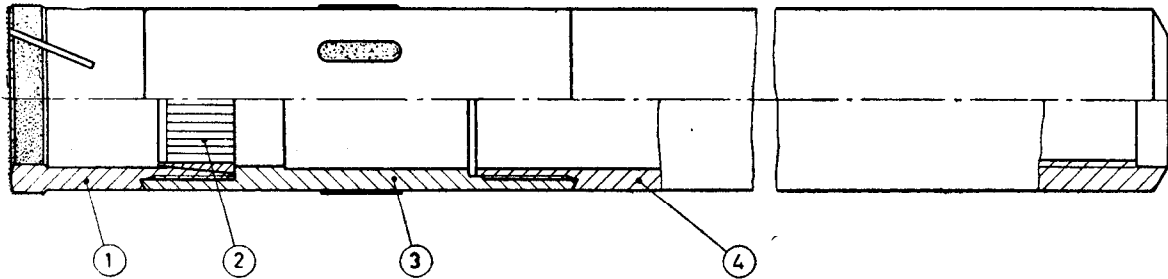
All dimensions in millimetres

Dimension		HWF	PWF	SWF	UWF	ZWF
A	Max	97.59	117.50	142.75	171.32	196.72
	Min	97.49	117.37	142.62	171.20	196.60
B	Max	86.64	104.90	127.13	155.70	181.10
	Min	86.51	104.78	127.00	155.58	180.98
B ₁	Max	89.28	109.09	133.73	161.42	186.82
	Min	88.52	108.33	132.97	160.66	186.06
B ₂	Max	89.92	108.36	132.84	162.28	187.68
	Min	89.66	108.10	132.59	162.03	187.43
C	Max	157.15	207.01	219.71	232.41	232.41
	Min	156.97	206.88	219.58	232.28	232.28
D	Max	112.83	143.00	143.89	146.94	146.94
	Min	112.70	142.75	143.64	146.68	146.68
E	Max	92.41	113.28	137.52	165.51	190.91
	Min	92.33	113.21	137.44	165.40	190.80
F	Max	90.80	110.90	135.13	163.12	188.52
	Min	90.70	110.79	135.03	162.99	188.39
Thread pitch		5.080	5.080	5.080	5.080	5.080
G	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
H	Max	26.97	38.23	38.23	38.23	38.23
	Min	26.85	38.10	38.10	38.10	38.10
J	Min	23.80	34.92	34.92	34.92	34.92
K	Max	3.43	5.00	5.00	5.00	5.00
	Min	2.92	4.50	4.50	4.50	4.50
L		0°	0°	0°	0°	0°
M	Max	92.58	111.94	136.19	165.33	190.73
	Min	92.48	111.84	136.09	165.20	190.60
N	Max	90.96	109.52	133.78	162.92	188.32
	Min	90.88	109.45	133.71	162.81	188.21
Thread pitch		5.080	5.080	5.080	5.080	5.080
P	Max	2.59	2.57	2.57	2.57	2.57
	Min	2.51	2.46	2.46	2.46	2.46
Q	Max	32.23	57.40	57.40	63.75	63.75
	Min	32.13	57.15	57.15	63.50	63.50
R	Max	28.26	51.30	51.30	57.65	57.65
	Min	27.76	50.80	50.80	57.15	57.15
S	Max	5.00	5.00	5.00	5.00	5.00
	Min	4.50	4.50	4.50	4.50	4.50
T		15°	15°	15°	15°	15°
V		30°	30°	30°	30°	30°
U	Max	7°15'	7°15'	7°15'	7°15'	7°15'
	Min	6°45'	6°45'	6°45'	6°45'	6°45'
X	Max	99.36	120.78	146.18	174.75	200.15
	Min	99.11	120.40	145.80	174.24	199.64

SECTION 4 CORE BARRELS — 'WG' DESIGN

17. 'WG' Design Single Tube Core Barrels

17.1 Nomenclature — A typical assembly of single tube core barrels is shown below:



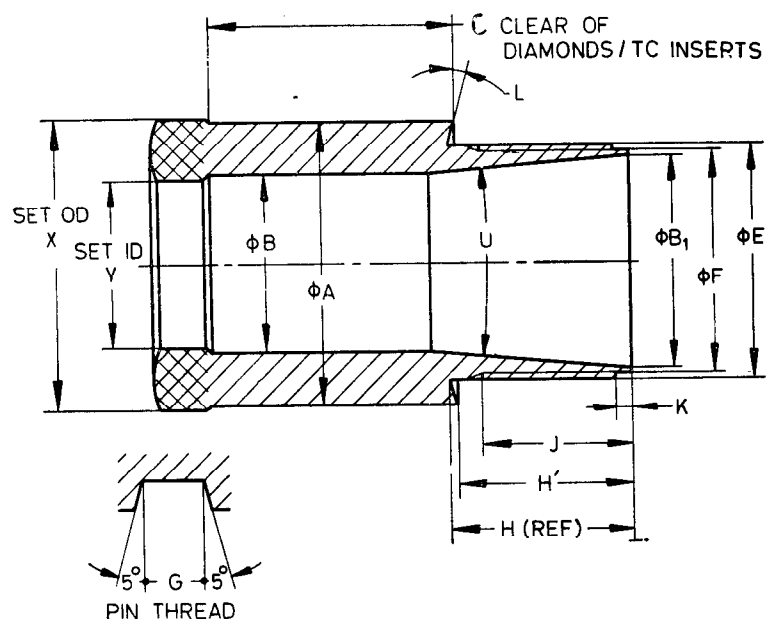
Reference Number	Description
1	Core bit
2	Core lifter
3	Reaming shell
4	Tube

17.1.1 Bits and core lifters are inter changeable with double tube barrels.

17.1.2 'WG' design core barrel shall have lengths of 1 500 mm, 3 000 mm and 6 000 mm

17.2 Detailed Dimensions

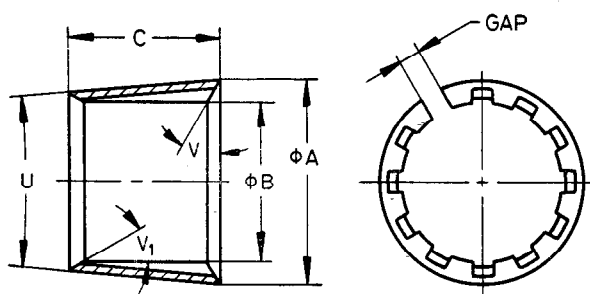
17.2.1 'WG' Design Single Tube Core Barrel — Bevel Wall Core Bit



All dimensions in millimetres

Dimension		EWG	AWG	BWG	NWG	HWG
A	Max	36.63	46.66	58.47	74.09	97.59
	Min	36.53	46.56	58.37	73.99	97.48
B	Max	22.96	31.85	44.04	57.00	79.35
	Min	22.86	31.75	43.94	56.90	79.25
B ₁	Max	27.43	36.96	48.46	64.34	88.90
	Min	27.33	36.86	48.36	64.24	88.77
C	Min	31.75	31.75	31.75	34.92	38.10
E	Max	30.12	39.65	51.56	67.44	92.40
	Min	30.07	39.60	51.51	67.39	92.35
F	Max	28.55	38.07	49.96	65.84	90.80
	Min	28.42	37.95	49.83	65.71	90.68
Thread pitch		3.175	3.175	3.175	3.175	3.175
G	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
H	Max	22.48	25.65	28.83	32.00	35.18
	Min	21.97	25.15	28.32	31.50	34.67
H'	Max	22.48	25.65	28.83	32.00	35.18
	Min	21.97	25.15	28.32	31.50	34.67
J	Min	19.05	22.22	25.40	28.58	31.75
K	Max	1.83	1.83	1.83	1.83	1.83
	Min	1.32	1.32	1.32	1.32	1.32
L		0°	0°	0°	0°	0°
U	Max	10°15'	10°15'	10°15'	10°15'	10°15'
	Min	9°45'	9°45'	9°45'	9°45'	9°45'
X	Max	37.46	47.75	59.69	75.44	98.98
	Min	37.21	47.50	59.44	75.18	98.60
Y	Max	21.59	30.23	42.16	54.86	76.33
	Min	21.34	29.97	41.91	54.61	76.07

17.2.2 'WG' Design Single Tube Core Barrel — Core Lifter



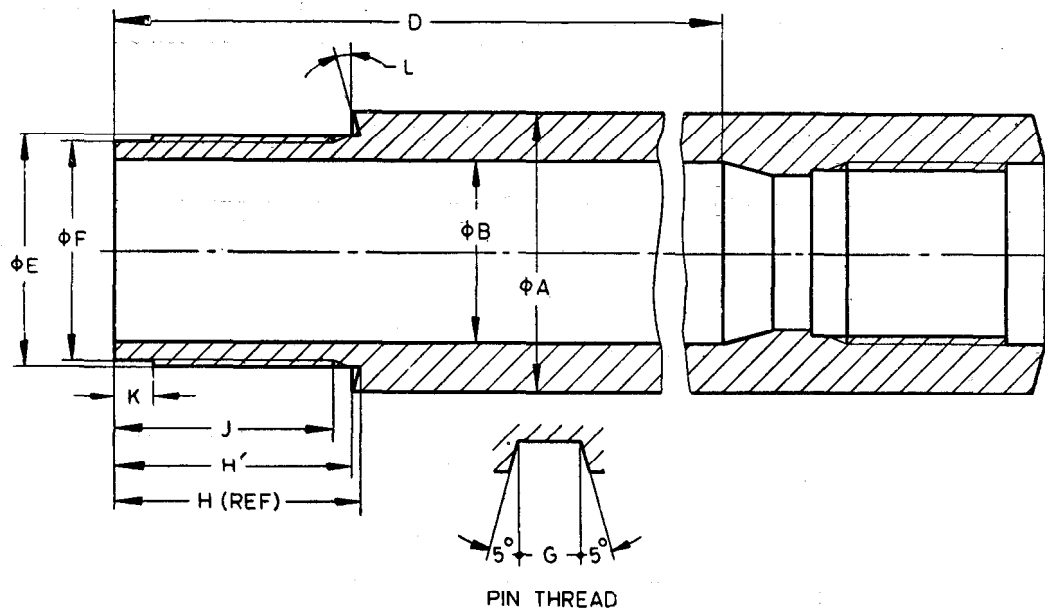
Note 1 — Width of gap, entry angle and number of flutes are at the discretion of manufacturer.

Note 2 — Core barrels with external flutes, if required by purchaser, shall conform to dimensions specified in this clause.

All dimensions in millimetres

Dimension		EWG	AWG	BWG	NWG	HWG
A	Max	26·31	35·84	47·34	63·22	87·35
	Min	26·21	35·74	47·24	63·12	87·25
B	Max	21·08	29·72	41·53	54·23	75·70
	Min	20·98	29·62	41·43	54·13	75·59
C	Max	19·43	22·61	24·18	32·13	51·18
	Min	18·67	21·84	23·42	31·37	50·42
U	Max	10°15'	10°15'	10°15'	10°15'	7°15'
	Min	9°45'	9°45'	9°45'	9°45'	6°45'
V		0°	0°	0°	0°	0°
V ₁		Optional				

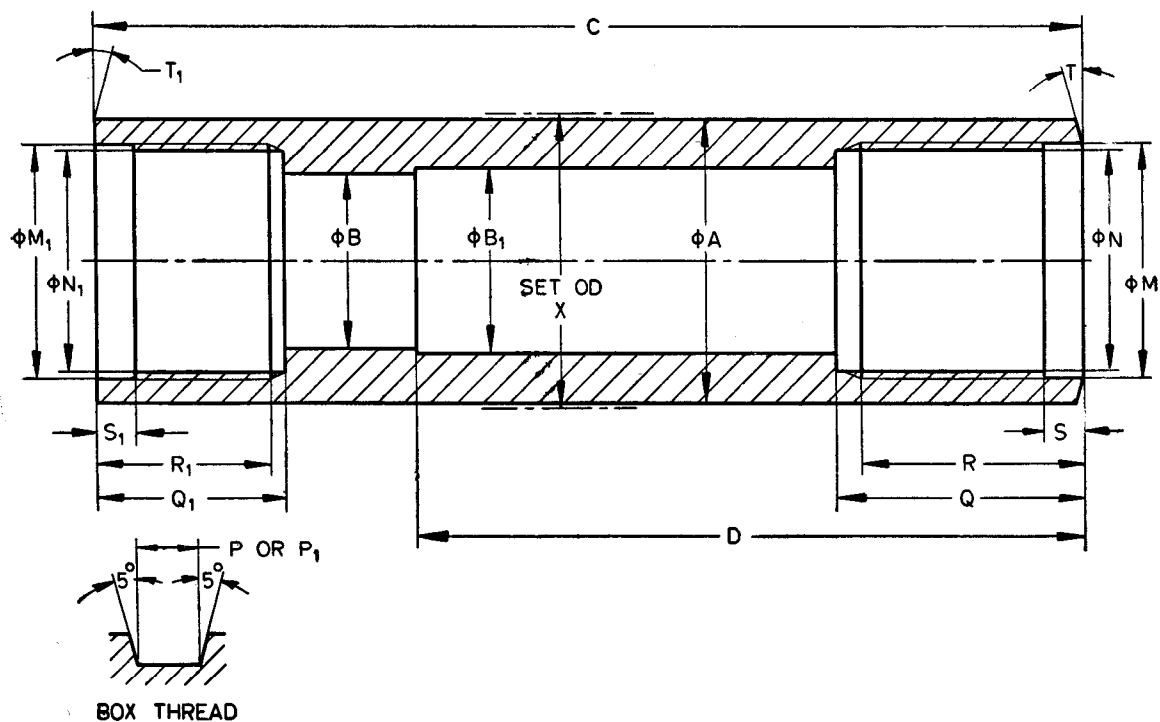
17.2.3 'WG' Design Single Tube Core Barrel — Tube



All dimensions in millimetres

Dimension		EWG	AWG	BWG	NWG	HWG
<i>A</i>	<i>Max</i> <i>Min</i>	36·63 36·50	46·28 40·02	58·19 57·94	74·07 73·81	95·63 95·25
<i>B</i>	<i>Max</i> <i>Min</i>	23·80 23·67	32·54 32·28	44·45 44·20	57·15 56·90	79·50 78·99
<i>D</i>	<i>Min</i>	3 003·55	3 003·55	3 003·55	3 003·55	3 000·38
<i>E</i>	<i>Max</i> <i>Min</i>	30·12 30·07	39·65 39·60	51·56 51·51	67·43 67·39	88·87 88·82
<i>F</i>	<i>Max</i> <i>Min</i>	28·55 28·42	38·07 37·95	49·96 49·83	65·84 65·71	87·27 87·15
Thread pitch		3·175	3·175	3·175	3·175	5·080
<i>G</i>	<i>Max</i> <i>Min</i>	1·63 1·55	1·63 1·55	1·63 1·55	1·63 1·55	2·59 2·51
<i>H</i>	<i>Max</i> <i>Min</i>	31·75 31·62	31·75 31·62	34·92 34·80	38·10 37·97	41·28 41·15
<i>H'</i>	<i>Max</i> <i>Min</i>	30·88 30·75	30·88 30·75	34·05 33·93	37·23 37·10	40·40 40·27
<i>J</i>	<i>Min</i>	28·58	28·58	31·75	34·92	37·29
<i>K</i>	<i>Max</i> <i>Min</i>	5·00 4·50	5·00 4·50	5·00 4·50	5·00 4·50	6·60 6·10
<i>L</i>		15°	15°	15°	15°	15°
Rod thread connection		EW	AW	BW	NW	HW

17.2.4 'WG' Design Single Tube Core Barrel — Reaming Shell

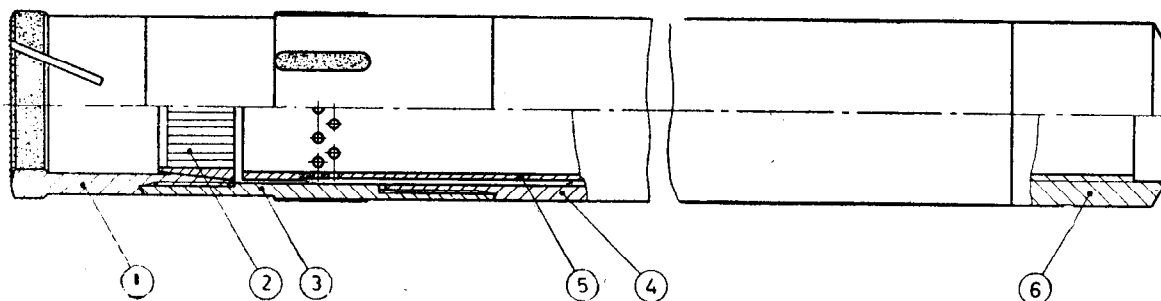


All dimensions in millimetres

Dimension		EWG	AWG	BWG	NWG	HWH
A	Max	36.63	46.66	58.47	74.09	97.59
	Min	36.53	46.56	58.37	73.99	97.49
B	Max	22.78	31.47	43.38	56.08	77.88
	Min	22.68	31.37	43.28	55.98	77.77
B ₁	Max	23.80	32.54	44.45	57.15	79.50
	Min	23.67	32.28	44.20	56.90	78.99
C	Max	127.25	130.43	138.35	146.30	152.65
	Min	126.75	129.92	137.85	145.80	152.15
D	Max	85.98	89.15	93.90	98.68	101.85
	Min	85.34	88.52	93.27	98.04	101.22
M	Max	30.23	39.75	51.66	67.54	89.03
	Min	30.18	39.70	51.61	67.49	88.98
N	Max	28.65	38.18	50.06	65.94	87.43
	Min	28.60	38.12	50.01	65.89	87.35
Thread pitch		3.175	3.175	3.175	3.175	5.080
P	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
Q	Max	31.88	31.88	35.05	38.23	41.40
	Min	31.75	31.75	34.92	38.10	41.28
R	Max	29.08	29.08	32.25	35.42	38.60
	Min	28.58	28.58	31.75	34.92	38.10
S	Max	5.00	5.00	5.00	5.00	6.05
	Min	4.50	4.50	4.50	4.50	5.54
T		15°	15°	15°	15°	15°
M ₁	Max	30.23	39.75	51.66	67.54	92.53
	Min	30.18	39.70	51.61	67.49	92.48
N ₁	Max	28.65	38.18	50.06	65.94	90.93
	Min	28.60	38.12	50.01	65.89	90.88
Thread pitch		3.175	3.175	3.175	3.175	5.080
P ₁	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
Q ₁	Max	23.93	27.10	31.88	36.63	39.24
	Min	23.80	26.97	31.75	36.50	38.86
R ₁	Max	22.70	25.90	29.08	33.82	35.42
	Min	22.20	25.40	28.58	33.32	34.92
S ₁	Max	5.00	5.00	5.00	5.00	6.05
	Min	4.50	4.50	4.50	4.50	5.54
T ₁		0°	0°	0°	0°	0°
X	Max	37.85	48.13	60.07	75.82	99.36
	Min	37.59	47.88	59.82	75.56	99.11

18. 'WG' Design Double Tube Core Barrels

18.1 Nomenclature — A typical assembly of double tube core barrel is shown below:



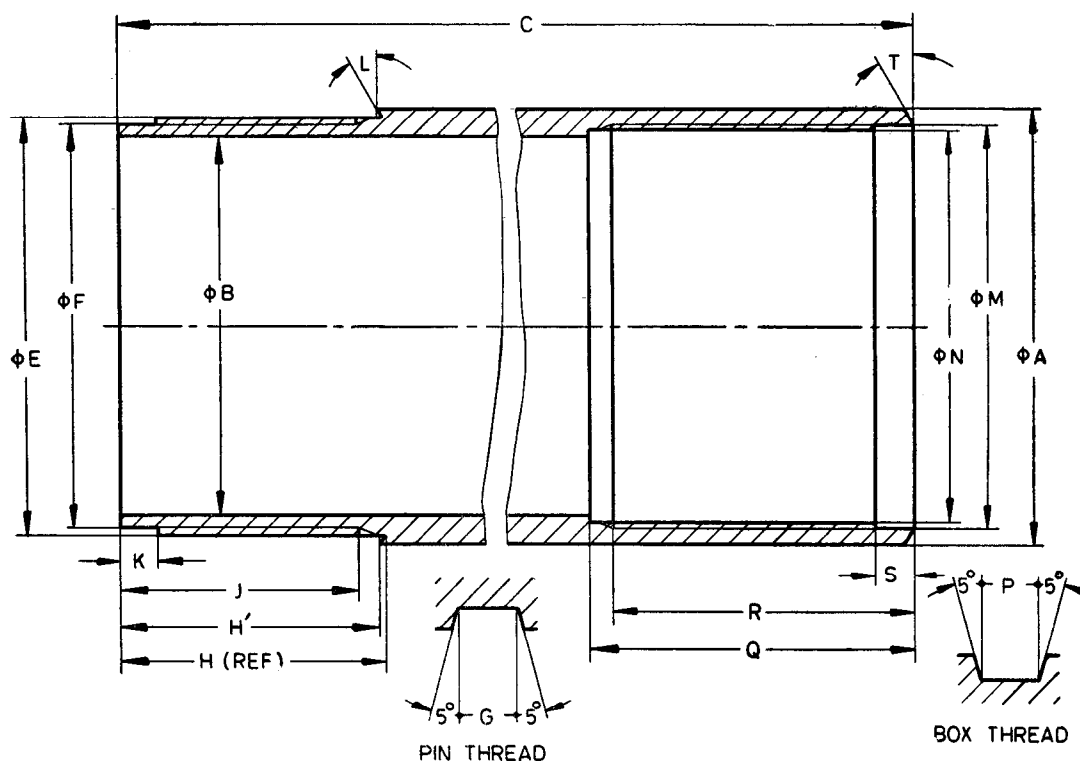
Ref No.	Description
1	Core bit
2	Core lifter
3	Reaming shell
4	Outer tube
5	Inner tube
6	Head-rigid or swivel

18.1.1 Bits and core lifters of single tube core barrel and double tube core barrel are interchangeable (For dimensions see 17.2.1 and 17.2.2).

18.1.2 'WG' Design double tube core barrels shall have lengths of 1 500 mm, 3 000 mm and 6 000 mm (lengths refers to core capacity).

18.2 Detailed Dimensions

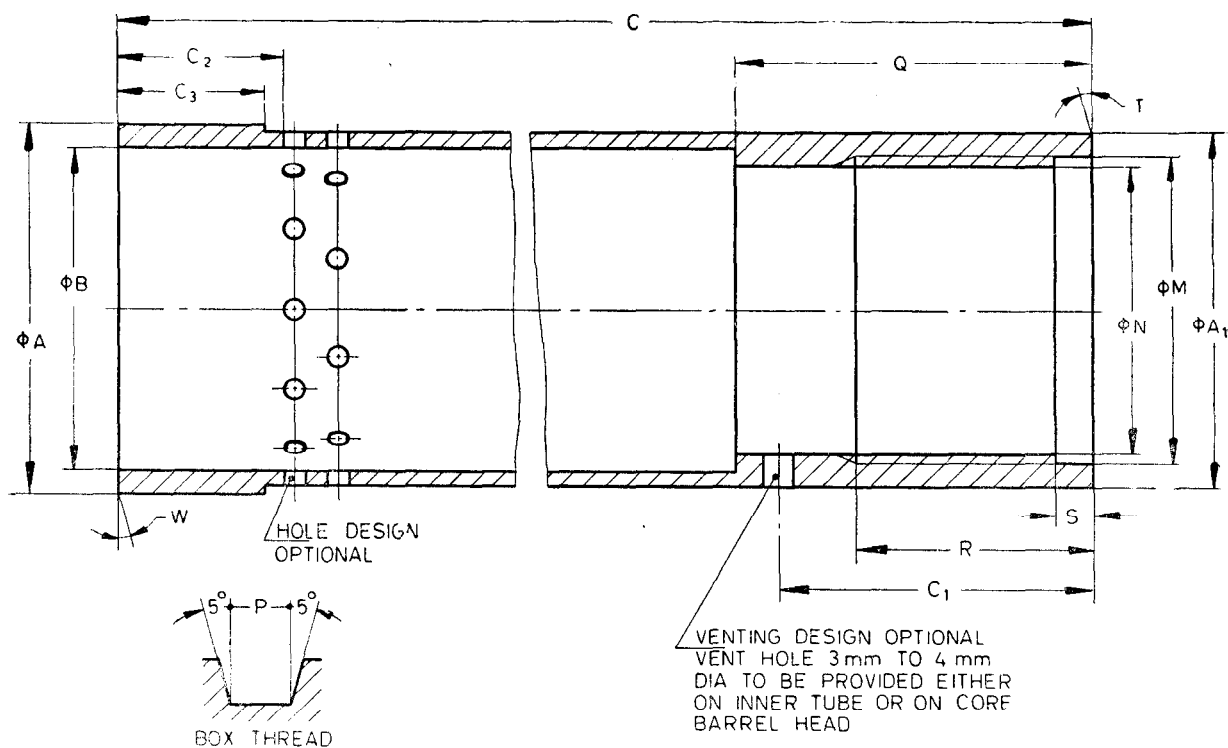
18.2.1 'WG' Design Double Tube Core Barrel — Outer Tube



All dimensions in millimetres

Dimension		EWG	AWG	BWG	NWG	HWG
A	Max	36.63	46.28	58.19	74.07	95.63
	Min	36.50	46.02	57.94	73.81	95.25
B	Max	30.15	38.89	50.80	66.68	85.85
	Min	30.02	38.63	50.55	66.42	85.34
C	Max	3 147.03	3 241.22	3 245.99	3 255.52	3 143.48
	Min	3 147.22	3 240.43	3 245.21	3 254.73	3 142.69
E	Max	34.49	43.87	55.73	71.60	92.40
	Min	34.44	43.81	55.68	71.55	92.33
F	Max	32.92	42.29	54.15	70.03	90.80
	Min	32.82	42.19	54.05	69.93	90.70
Thread pitch		3.175	3.175	3.175	3.175	5.080
G	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
H	Max (Ref)	31.75	31.75	34.92	38.10	32.13
	Min (Ref)	31.62	31.62	34.80	37.97	32.03
H'	Max	31.47	31.44	34.60	37.78	31.72
	Min	31.34	31.31	34.48	37.65	31.62
J	Min	28.58	28.58	31.75	34.92	28.58
K	Max	5.00	5.00	5.00	5.00	5.00
	Min	4.50	4.50	4.50	4.50	4.50
L		15°	15°	15°	15°	15°
M	Max	31.83	42.14	54.05	69.93	89.05
	Min	31.78	42.09	54.00	69.88	88.95
N	Max	30.23	40.54	52.45	68.33	86.64
	Min	30.18	40.49	52.40	68.28	86.56
Thread pitch		3.175	3.175	3.175	3.175	5.080
F	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
Q	Max	30.65	37.00	43.35	49.70	35.42
	Min	30.15	36.50	42.85	49.20	34.92
R	Max	27.47	33.82	40.17	46.52	32.25
	Min	26.97	33.32	39.67	46.02	31.75
S	Max	5.00	5.00	5.00	5.00	6.05
	Min	4.50	4.50	4.50	4.50	5.54
T		30°	30°	30°	30°	15°

18.2.2 'WG' Design Double Tube Core Barrel — Inner Tube



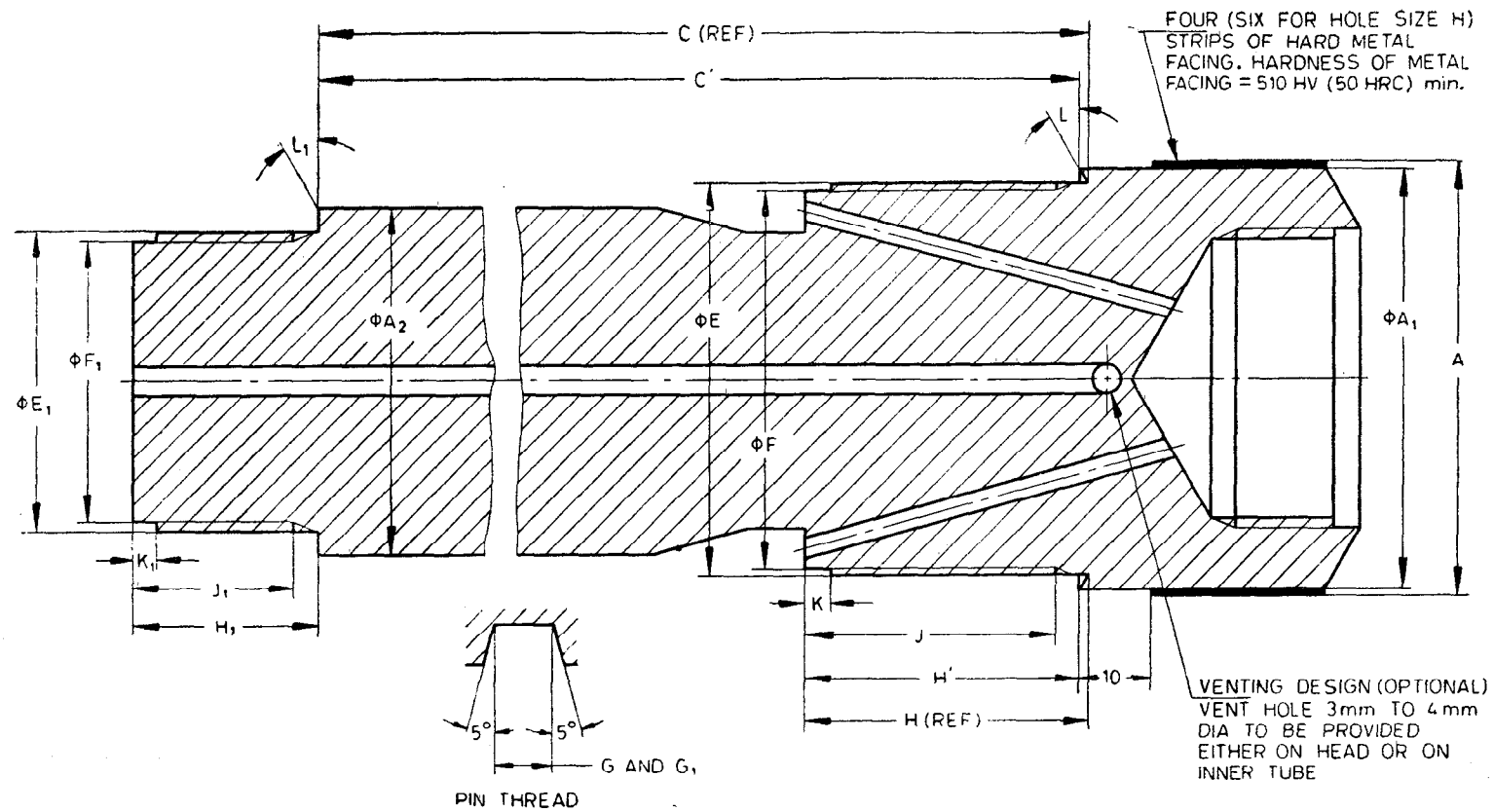
Note 1 — Ends of inner tube need not be integral. Method of manufacture optional.

Note 2 — Dimension C_1 is applicable only if hole is provided on inner tube.

All dimensions in millimetres

Dimension		EWG	AWG	BWG	NWG	HWG
A	Max	28.45	37.97	49.78	65.66	85.34
	Min	28.32	37.85	49.66	65.53	85.22
A_1	Max	27.10	35.97	47.88	63.75	82.93
	Min	26.97	35.71	47.62	63.50	82.55
B	Max	23.80	31.75	43.64	57.15	77.90
	Min	23.67	31.50	43.39	56.90	77.39
C	Max	3 109.11	3 117.04	3 121.81	3 131.34	3 114.68
	Min	3 108.32	3 116.25	3 121.02	3 130.55	3 113.89
C_1	Max	29.34	37.26	42.04	51.56	35.69
	Min	27.81	35.74	40.51	50.04	34.16
C_2	Min	19.05	19.05	22.22	25.40	26.97
C_3	Max	16.26	16.26	19.43	22.61	25.78
	Min	15.88	15.88	19.05	22.22	25.40
M	Max	20.70	29.44	41.35	57.23	63.63
	Min	20.65	29.39	41.30	57.18	63.55
N	Max	19.13	27.05	38.96	54.84	61.49
	Min	19.08	27.00	38.91	54.79	61.44
Thread pitch		3.175	3.175	3.175	3.175	5.080
P	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
Q	Max	35.05	42.98	47.75	57.28	41.40
	Min	34.80	42.73	47.50	57.02	41.15
R	Min	22.22	31.75	31.75	31.75	31.75
S	Max	5.00	5.00	5.00	5.00	6.05
	Min	4.50	4.50	4.50	4.50	5.54
T		0°	0°	0°	0°	0°
Holes (minimum total area) mm^2		142.58	185.81	238.71	325.16	419.35
W		0°	0°	0°	0°	0°

18.2.3 'WG' Design Double Tube Core Barrel — Head



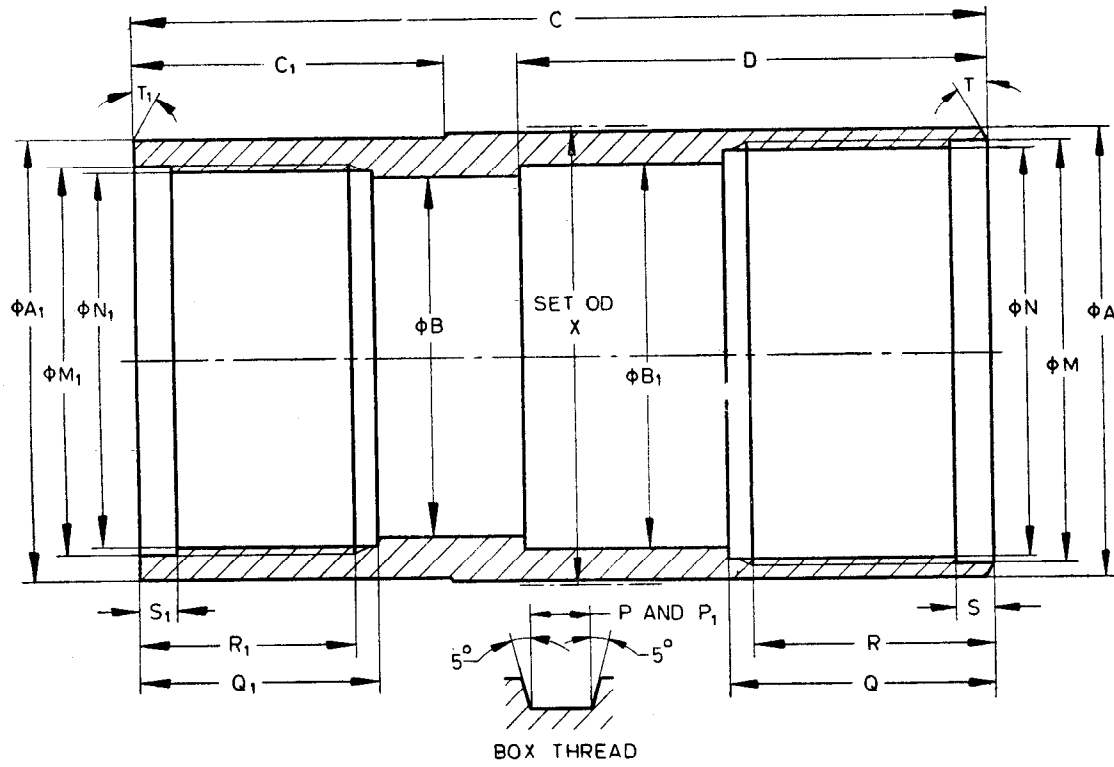
Note — The hardness of metal strip in HRC is approximate value.

All dimensions in millimetres

Dimension		*EWG	*AWG	BWG†	NWG†	HWG‡
A	Max	36.90	47.12	58.93	74.55	97.78
	Min	36.78	47.00	58.81	74.43	97.66
A ₁	Max	36.63	46.15	58.06	73.94	95.45
	Min	36.37	45.90	57.81	73.69	95.07
A ₂	Max	27.10	35.97	47.88	63.75	82.55
	Min	26.97	35.71	47.62	63.50	82.17
C	Max	84.23	170.54	170.54	170.54	134.52
	Min	83.59	169.90	169.90	169.90	134.14
C'	Max	82.84	169.39	169.38	169.38	133.66
	Min	82.20	168.75	168.74	168.74	133.28
E	Max	31.72	42.04	53.95	69.82	88.90
	Min	31.67	41.99	53.90	69.77	88.82
F	Max	30.12	40.44	52.35	68.22	86.51
	Min	30.00	40.31	52.22	68.10	86.41
Thread pitch		3.175	3.175	3.175	3.175	5.08
G	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
H	Max	26.77	32.92	39.27	45.62	32.61
	Min	26.39	32.54	38.89	45.24	32.23
H'	Max	25.38	31.77	38.11	44.46	31.75
	Min	25.00	31.39	37.73	44.08	31.37
J	Min	22.22	28.58	34.92	41.28	28.58
K	Max	3.43	3.43	3.43	3.43	3.43
	Min	2.92	2.92	2.92	2.92	2.92
L		30°	30°	30°	30°	15°
E ₁	Max	20.60	29.34	41.25	57.12	63.50
	Min	20.55	29.29	41.20	57.07	63.45
F ₁	Max	19.02	26.95	38.86	54.74	61.39
	Min	18.90	26.82	38.74	54.61	61.29
Thread pitch		3.175	3.175	3.175	3.175	5.08
G ₁	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
H ₁	Max	19.05	22.22	25.40	28.58	31.75
	Min	18.67	21.84	25.02	28.19	31.37
J ₁	Min	15.88	19.05	22.22	25.40	28.58
K ₁	Max	3.43	3.43	3.43	3.43	3.43
	Min	2.92	2.92	2.92	2.92	2.92
L ₁		0°	0°	0°	0°	0°
Rod thread connection		EW	AW	BW	NW	HW

*These items interchange with the 'WM' design core barrels.
†These items interchange with the 'WM', 'WT' and 'WTM' design core barrels.
‡This item is interchangeable with the 'WF' design core barrel.

18.2.4 'WG' Design Double Tube Core Barrel — Reaming Shell



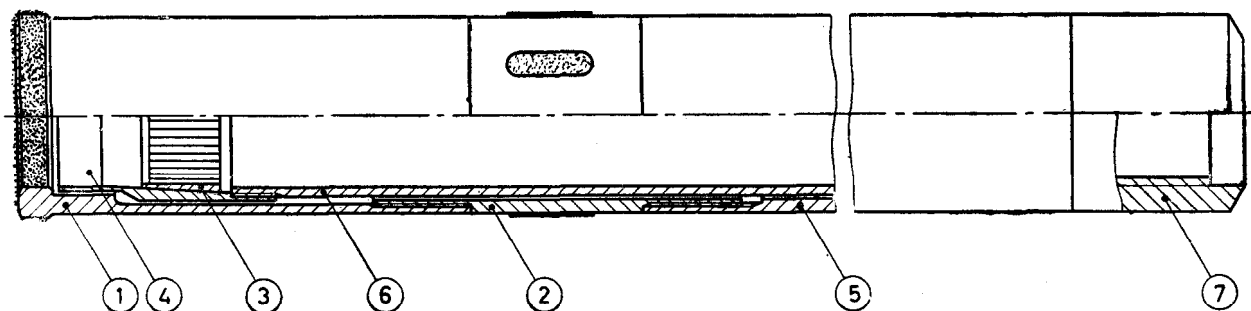
All dimensions in millimetres

Dimension		EWG	AWG	BWG	NWG	HWG
A	Max	37.01	47.04	58.85	74.57	97.97
	Min	36.91	46.94	58.75	74.47	97.87
A ₁	Max	36.63	46.66	58.47	74.09	97.59
	Min	36.53	46.56	58.37	73.99	97.48
B	Max	28.65	38.18	50.06	65.94	85.60
	Min	28.60	38.13	50.01	65.89	85.47
B ₁	Max	30.15	38.89	50.80	66.68	87.38
	Min	30.02	38.76	50.67	66.55	87.25
C	Max	101.85	105.03	112.95	120.90	139.70
	Min	101.35	104.52	112.45	120.40	139.19
C ₁	Max	33.45	36.63	41.40	46.15	47.75
	Min	33.32	36.50	41.28	46.02	47.62
D	Max	62.03	62.03	62.03	62.03	76.33
	Min	61.90	61.90	61.90	61.90	76.20
M	Max	34.59	43.97	55.83	71.70	92.53
	Min	34.54	43.92	55.78	71.65	92.48
N	Max	33.02	42.39	54.25	70.13	90.93
	Min	32.97	42.34	54.20	70.08	90.88
Thread pitch		3.175	3.175	3.175	3.175	5.08
P	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
Q	Max	31.88	31.88	35.05	38.23	32.23
	Min	31.75	31.75	34.92	38.10	32.13
R	Max	29.08	29.08	32.25	35.42	30.65
	Min	28.58	28.58	31.75	34.92	30.15
S	Max	5.00	5.00	5.00	5.00	6.05
	Min	4.50	4.50	4.50	4.50	5.54
T		15°	15°	15°	15°	15°
M ₁	Max	30.23	39.75	51.66	67.54	92.53
	Min	30.18	39.70	51.61	67.49	92.48
N ₁	Max	28.65	38.18	50.06	65.94	90.93
	Min	28.60	38.12	50.01	65.89	90.88
Thread pitch		3.175	3.175	3.175	3.175	5.08
P ₁	Max	1.63	1.63	1.63	1.63	2.59
	Min	1.55	1.55	1.55	1.55	2.51
Q ₁	Max	This length does not exist owing to bores 'B' and 'N' being identical				39.24
	Min					
R ₁	Max	22.70	25.90	29.08	33.82	35.42
	Min	22.20	25.40	28.58	33.32	34.92
S ₁	Max	5.00	5.00	5.00	5.00	6.05
	Min	4.50	4.50	4.50	4.50	5.54
T ₁		0°	0°	0°	0°	0°
X	Max	37.85	48.13	60.07	75.82	99.36
	Min	37.59	47.88	59.82	75.56	99.11

SECTION 5 CORE BARRELS — 'WM' DESIGN

19. 'WM' Design Double Tube Core Barrels

19.1 Nomenclature — A typical assembly of swivel type double tube core barrel of 'WM' design is shown below:

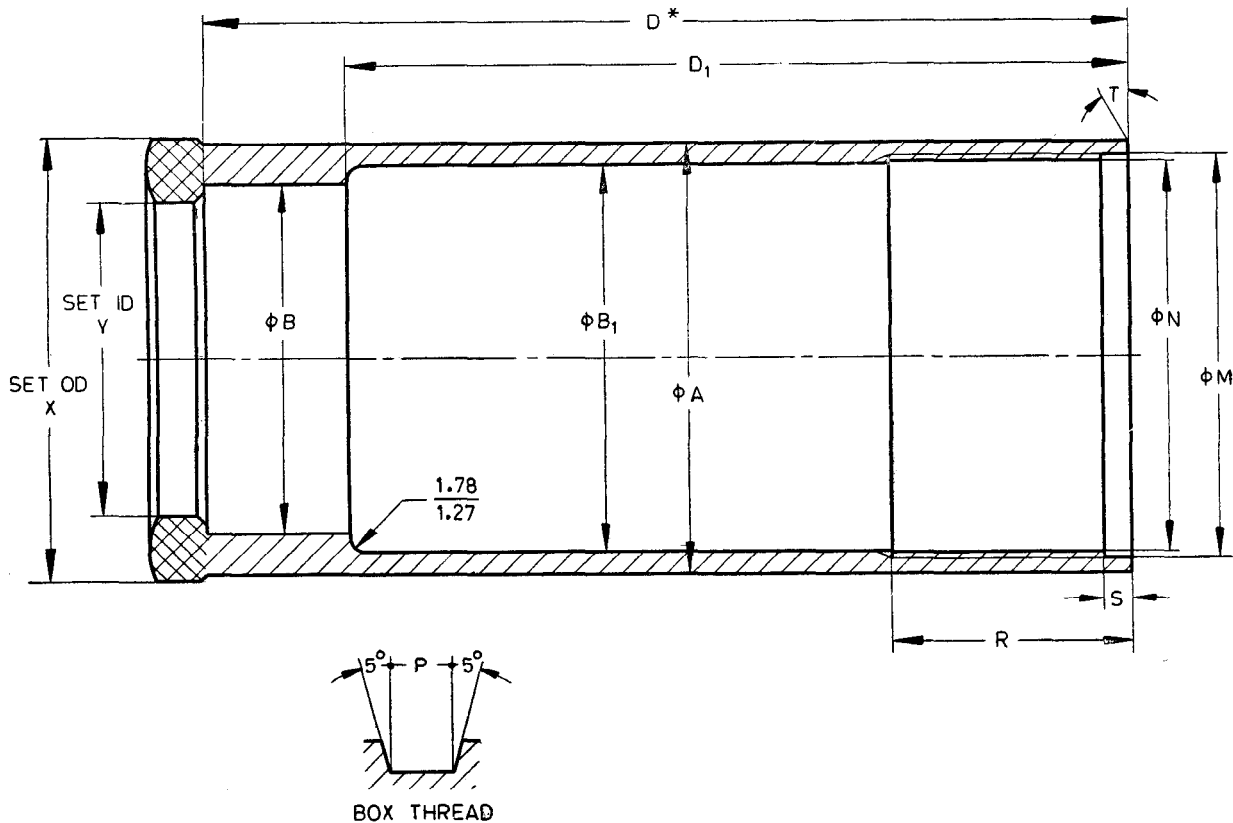


Ref No.	Part
1	Core bit
2	Reaming shell
3	Core lifter
4	Lifter case
5	Outer tube
6	Inner tube
7	Head thread only

19.1.1 'WM' design double tube core barrels shall have lengths of 1.5 m, 3.0 m and 6.0 m (lengths refer to core capacity).

19.2 Detailed Dimensions

19.2.1 'WM' Design — Double Tube Core Barrel — Core Bit

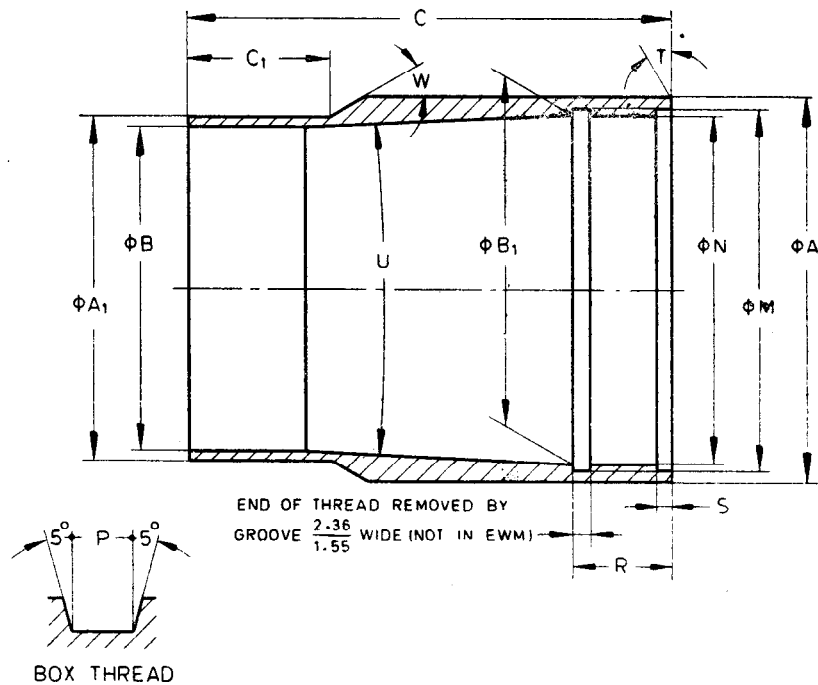


*Dimension from RH end to bottom of counterbore (ϕB).

All dimensions in millimetres

Dimension		EWM	AWM	BWM	NWM
A	Max	36·09	46·15	57·94	73·86
	Min	35·97	46·02	57·61	73·74
B	Max	27·10	35·31	48·81	61·24
	Min	26·97	35·18	48·69	61·11
B ₁	Max	31·80	40·49	52·40	68·38
	Min	31·67	40·36	52·27	68·25
D	Max	124·48	124·48	122·94	153·16
	Min	123·70	123·70	122·17	152·40
D ₁	Max	104·09	104·09	104·09	132·60
	Min	103·84	103·84	103·84	132·41
M	Max	33·48	42·14	54·03	70·71
	Min	33·35	42·09	54·00	70·63
N	Max	31·83	40·54	52·45	69·11
	Min	31·78	40·49	52·40	69·08
Thread pitch		3·175	3·175	3·175	3·175
P	Max	1·63	1·63	1·63	1·63
	Min	1·55	1·55	1·55	1·55
R	Max	32·25	32·25	32·25	35·42
	Min	31·75	31·75	31·75	34·92
S	Max	3·43	3·43	3·43	3·43
	Min	2·92	2·92	2·92	2·92
T		0°	0°	0°	0°
X	Max	37·46	47·75	59·68	75·44
	Min	37·21	47·50	59·44	75·16
Y	Max	21·69	30·23	42·16	54·88
	Min	21·24	29·97	41·91	54·61

19.2.2 'WM' Design Double Tube Core Barrel — Core Lifter Case



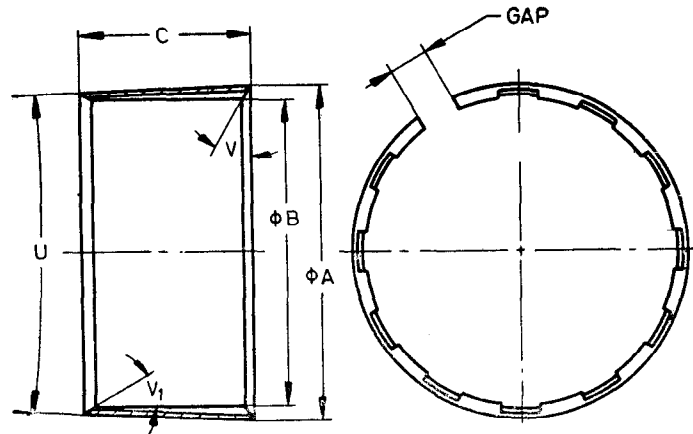
Note — This thread form does not apply to EWM size (see note below the tables)

All dimensions in millimetres

Dimension		EWM	AWM	BWM	NWM
A	Max	30.15	38.89	50.80	66.68
	Min	30.02	38.76	50.67	66.55
A ₁	Max	25.45	33.55	45.29	59.56
	Min	25.32	33.43	45.16	59.44
B	Max	23.09	31.19	42.90	57.20
	Min	22.96	31.06	42.77	57.07
B ₁	Max	26.24	34.16	46.08	61.95
	Min	26.19	34.11	46.02	61.90
C	Max	68.33	65.15	63.58	87.38
	Min	68.20	65.02	63.45	87.25
C ₁	Max	20.78	20.78	19.18	20.78
	Min	20.52	20.52	18.92	20.52
M	Max	26.37	35.79	47.70	63.58
	Min	26.21	35.74	47.65	63.53
N	Max	24.76	34.19	46.10	61.98
	Min	24.71	34.14	46.05	61.93
Thread pitch		*	3.175	3.175	3.175
P	Max	*	1.63	1.63	1.63
	Min	*	1.55	1.55	1.55
R	Max thread	11.23	12.83	12.83	16.00
	Min thread	10.97	12.57	12.57	15.75
S	Max	1.70	1.70	1.70	1.70
	Min	1.45	1.45	1.45	1.45
T		0°	0°	0°	0°
U	Max	5°15'	5°15'	5°15'	5°15'
	Min	4°45'	4°45'	4°45'	4°45'
W		30°	30°	30°	30°

*The thread dimension for the EWM shall be according to established practices.

19.2.3 'WM' Design Double Tube Core Barrel — Core Lifter



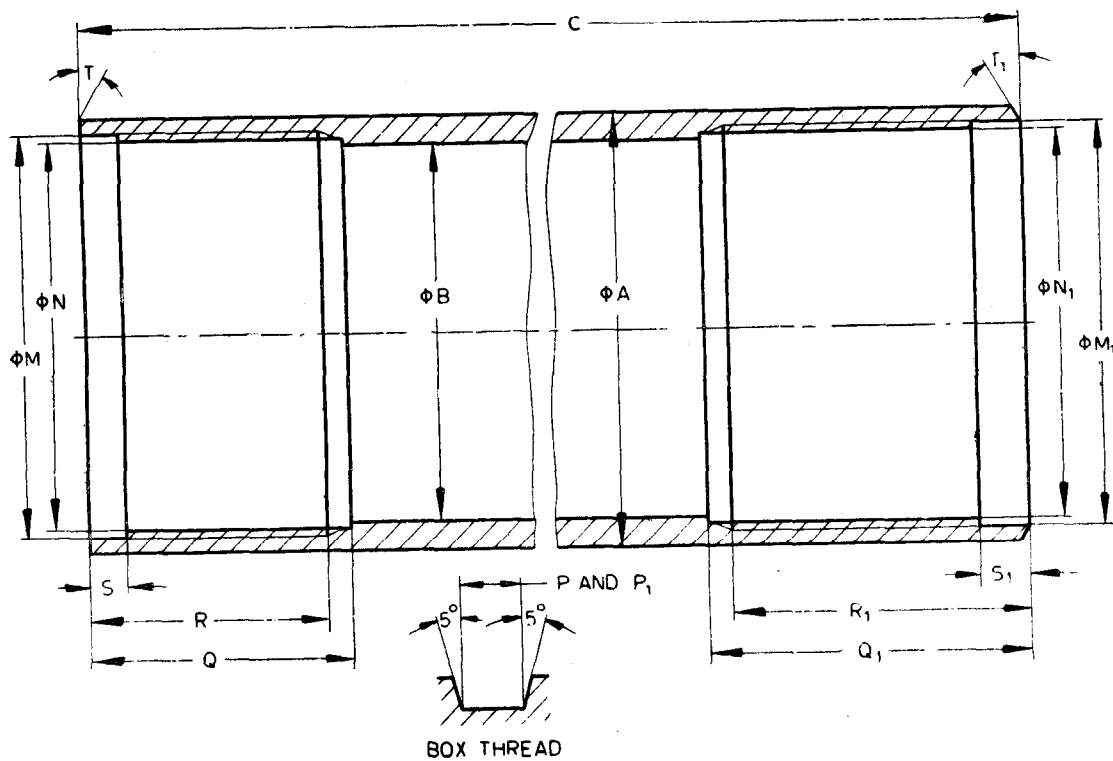
Note 1 — Width of gap, entry angle and number of flutes are at the discretion of manufacturer.

Note 2 — Core lifter with external flutes if required by purchaser, shall conform to dimensions specified in this clause.

All dimensions in millimetres

Dimension		EWM	AWM	BWM	NWM
A	Max	25.32	33.25	45.03	60.91
	Min	25.22	33.15	44.93	60.81
B	Max	21.08	29.72	41.53	54.23
	Min	20.98	29.62	41.43	54.13
C	Max	19.43	22.61	22.61	35.31
	Min	18.67	21.84	21.84	34.54
U	Max	5°15'	5°15'	5°15'	5°15'
	Min	4°45'	4°45'	4°45'	4°45'
V		0°	0°	0°	0°
V ₁	Optional				

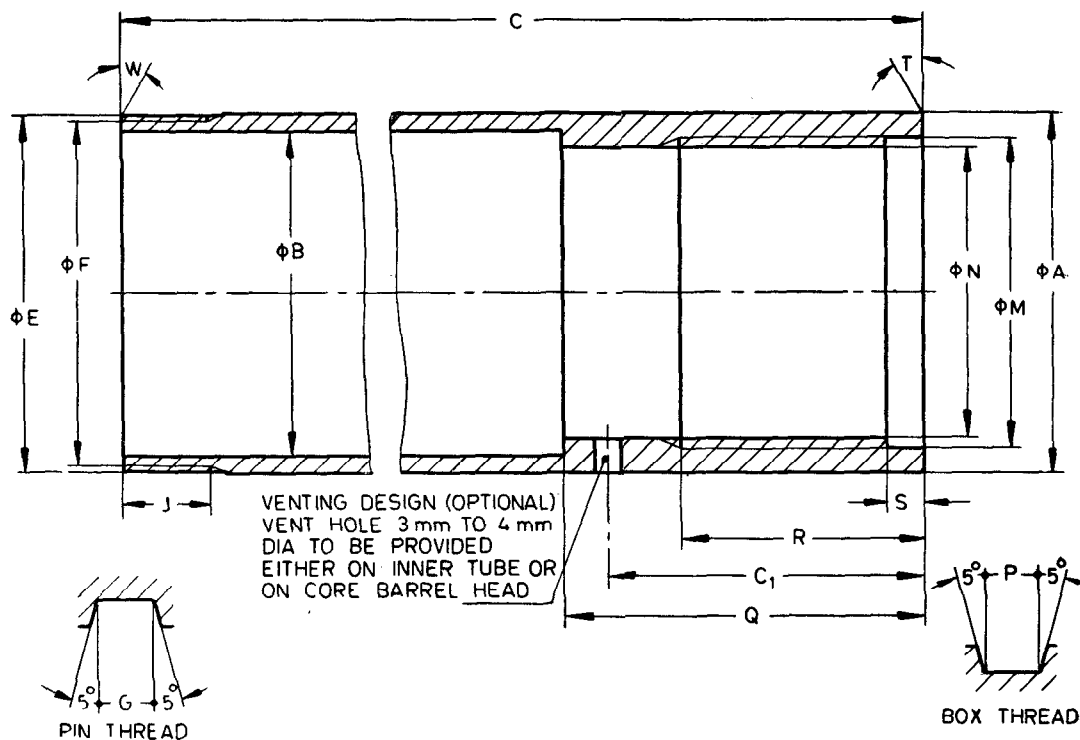
19.2.4 'WM' Design Double Tube Core Barrel — Outer Tube



All dimensions in millimetres.

Dimension		EWM	AWM	BWM	NWM
A	Max	36.63	46.28	58.19	74.07
	Min	36.50	46.02	57.94	73.81
B	Max	30.15	38.89	50.80	66.68
	Min	30.05	38.63	50.55	66.42
C	Max	3 053.18	3 142.84	3 147.59	3 148.00
	Min	3 052.34	3 142.06	3 146.81	3 147.21
M	Max	33.40	42.14	54.05	70.71
	Min	33.35	42.09	54.00	70.66
N	Max	31.83	40.54	52.45	69.11
	Min	31.78	40.49	52.40	69.06
Thread pitch		3.175	3.175	3.175	3.175
P	Max	1.63	1.63	1.63	1.63
	Min	1.55	1.55	1.55	1.55
Q	Max	35.42	35.42	35.42	38.60
	Min	34.92	34.92	34.92	38.10
R	Max	32.25	32.25	32.25	35.42
	Min	31.75	31.75	31.75	34.92
S	Max	5.00	5.00	5.00	5.00
	Min	4.50	4.50	4.50	4.50
T		0°	0°	0°	0°
M ₁	Max	31.83	42.14	54.05	69.93
	Min	31.78	42.09	54.00	69.88
N ₁	Max	30.23	40.54	52.45	68.33
	Min	30.18	40.49	52.40	68.28
Thread pitch		3.175	3.175	3.175	3.175
P ₁	Max	1.63	1.63	1.63	1.63
	Min	1.55	1.55	1.55	1.55
Q ₁	Max	30.65	37.00	42.85	49.20
	Min	30.15	36.50	42.85	49.20
R ₁	Min	26.97	33.32	39.67	46.02
S ₁	Max	6.60	6.60	6.60	6.60
	Min	6.10	6.10	6.10	6.10
T ₁		30°	30°	30°	30°

19.2.5 'WM' Design Double Tube Core Barrel — Inner Tube

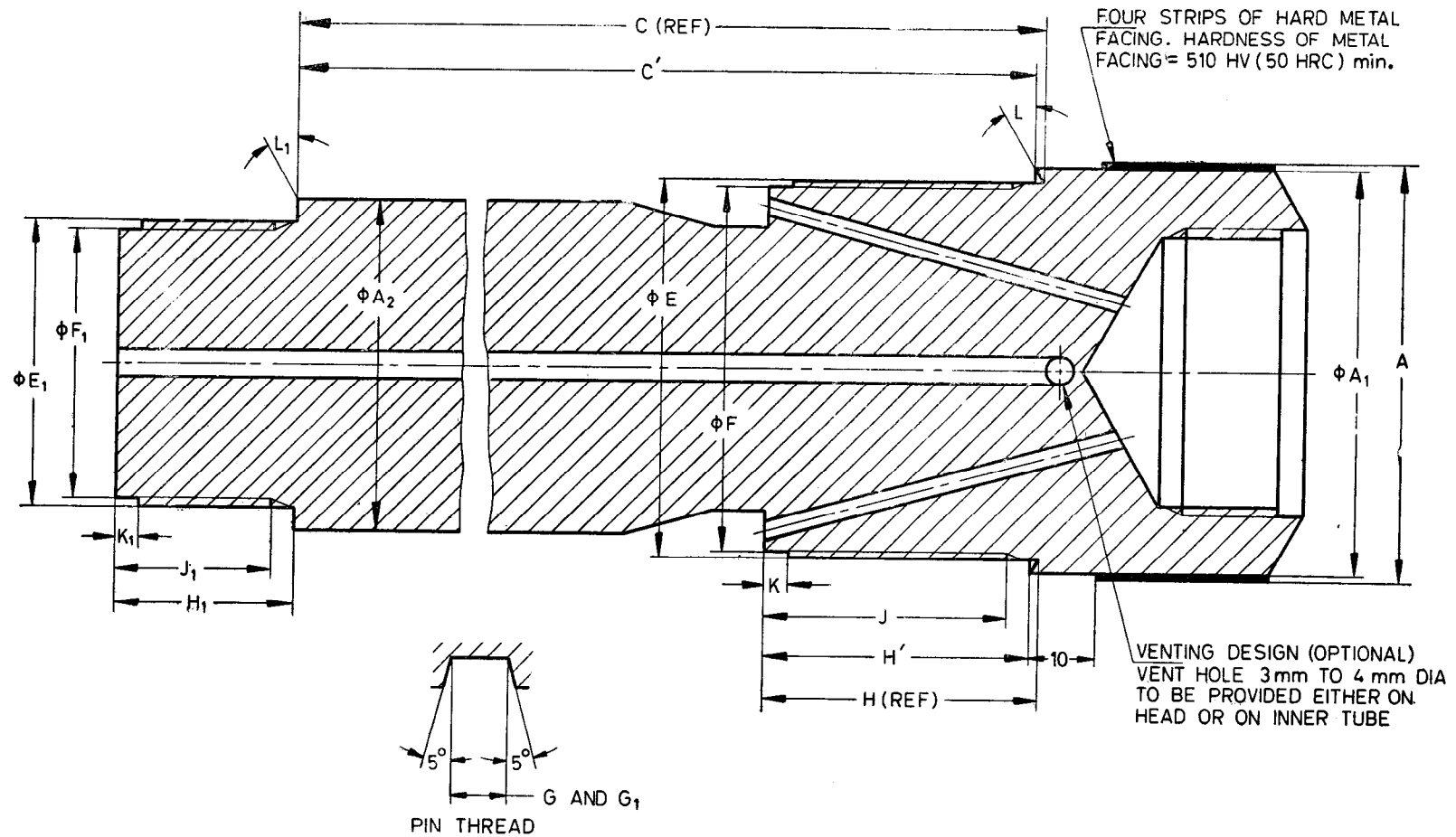
Note 1 — Dimension C₁ is applicable only if vent hole is provided on inner tube.

Note 2 — Top end of inner tube need not be integral method of manufacture optional.

All dimensions in millimetres.

Dimension		EWM	AWM	BWM	NWM
A	Max	27.10	35.97	47.88	63.75
	Min	26.97	35.71	47.62	63.50
B	Max	23.80	31.75	43.64	57.15
	Min	23.67	31.50	43.38	56.90
C	Max	3 083.31	3 091.26	3 096.01	3 105.53
	Min	3 082.52	3 090.44	3 095.22	3 104.74
C ₁	Max	29.34	37.26	42.04	51.56
	Min	27.81	35.74	40.51	50.04
E	Max	26.16	35.69	47.60	63.47
	Min	26.01	35.64	47.55	63.42
F	Max	*	34.09	46.00	61.87
	Min	*	33.96	45.87	61.75
Thread pitch		*	3.175	3.175	3.175
G	Max	*	1.63	1.63	1.63
	Min	*	1.55	1.55	1.55
J	Max	11.23	11.23	11.23	16.00
	Min	10.97	10.97	10.97	15.75
M	Max	20.70	29.44	41.35	57.23
	Min	20.65	29.39	41.30	57.18
N	Max	19.13	27.05	38.96	54.84
	Min	19.08	27.00	38.91	54.79
Thread pitch		3.175	3.175	3.175	3.175
P	Max	1.63	1.63	1.63	1.63
	Min	1.55	1.55	1.55	1.55
Q	Max	35.31	43.23	48.01	57.53
	Min	34.54	42.47	47.24	56.77
R	Max	22.72	32.25	32.25	32.25
	Min	22.22	31.75	31.75	31.75
S	Max	5.00	5.00	5.00	5.00
	Min	4.50	4.50	4.50	4.50
T		0°	0°	0°	0°
W		0°	0°	0°	0°
*The thread dimensions for the EWM shall be according to established practices.					

19.2.6 'WM' Design Double Core Barrel — Head

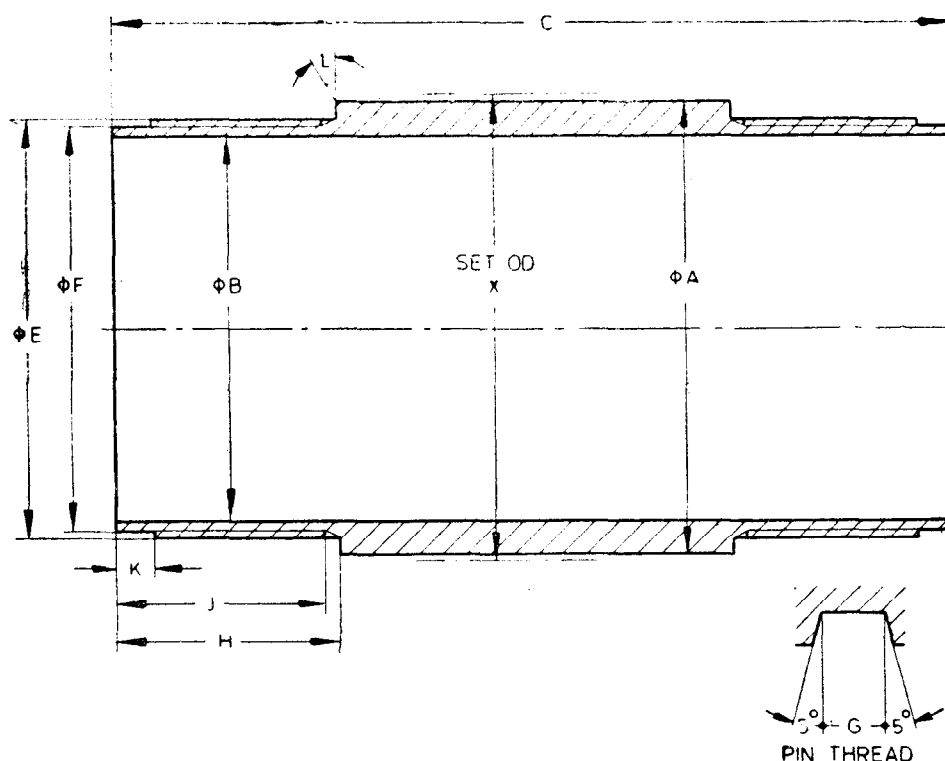


Note — The hardness of metal facing in HRC is approximate value.

All dimensions in millimetres

Dimension		*EWM	*AWM	*BWM†	*NWM†
A	Max	36·90	47·12	58·93	74·55
	Min	36·78	47·00	58·81	74·42
A ₁	Max	36·63	46·15	58·06	73·94
	Min	36·37	45·90	57·81	73·69
A ₂	Max	27·10	35·97	47·88	63·75
	Min	26·97	35·71	47·63	63·50
C	Max	84·23	170·54	170·54	170·54
	Min	83·59	169·90	169·90	169·90
C'	Max	82·84	169·39	169·38	169·38
	Min	82·20	168·75	168·74	168·74
E	Max	31·72	42·04	53·95	69·82
	Min	31·67	41·99	53·90	69·77
F	Max	30·12	40·44	52·35	68·22
	Min	30·00	40·31	52·22	68·10
Thread pitch		3·175	3·175	3·175	3·175
G	Max	1·63	1·63	1·63	1·63
	Min	1·55	1·55	1·55	1·55
H	Max	26·77	32·92	39·27	45·62
	Min	26·39	32·54	38·89	45·24
H'	Max	25·28	31·77	38·11	44·46
	Min	25·00	31·29	37·73	44·08
J	Min	22·22	28·58	34·92	41·28
K	Max	3·43	3·43	3·43	3·43
	Min	2·92	2·92	2·92	2·92
L		30°	30°	30°	30°
E ₁	Max	20·60	29·34	41·25	57·12
	Min	20·55	29·29	41·20	57·07
F ₁	Max	19·02	26·95	38·86	54·74
	Min	18·90	26·82	38·74	54·61
Thread pitch		3·175	3·175	3·175	3·175
G ₁	Max	1·63	1·63	1·63	1·63
	Min	1·55	1·55	1·55	1·55
H ₁	Max	19·05	22·22	25·40	28·58
	Min	18·67	21·84	25·02	28·19
J ₁	Min	15·88	19·05	22·22	25·40
K ₁	Max	3·43	3·43	3·43	3·43
	Min	2·92	2·92	2·92	2·92
L ₁		0°	0°	0°	0°
Road thread connection		EW	AW	BW	NW

19.2.7 'WM' Design Double Tube Core Barrel — Reaming Shell



Note — Dimensions shown apply to both ends.

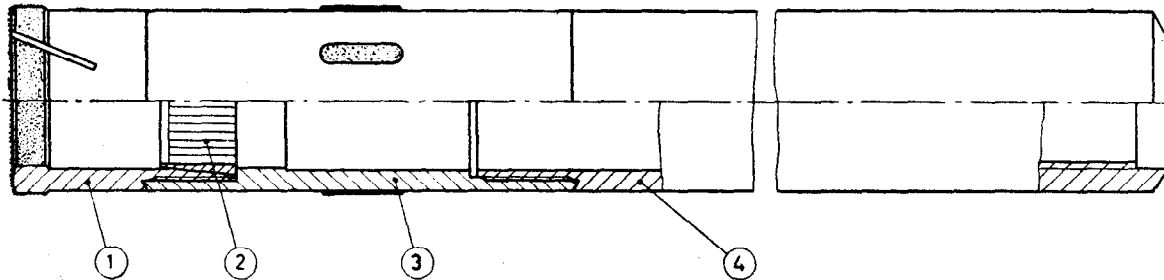
All dimensions in millimetres

Dimension		EWM	AWM	BWM	NWM
A	Max	36·37	46·66	58·47	74·09
	Min	36·27	46·56	58·37	73·99
B	Max	29·44	38·18	50·04	65·99
	Min	29·31	38·05	49·91	65·86
C	Max	108·20	108·20	108·20	114·55
	Min	107·70	107·70	107·70	114·05
E	Max	33·30	42·04	53·95	70·61
	Min	33·25	41·99	53·90	70·56
F	Max	31·72	40·44	52·35	69·01
	Min	31·60	40·31	52·22	68·88
Thread pitch		3·175	3·175	3·175	3·175
G	Max	1·63	1·63	1·63	1·63
	Min	1·55	1·55	1·55	1·55
H	Max	28·83	28·83	28·83	32·00
	Min	28·32	28·32	28·32	31·50
J	Min	26·97	26·97	26·97	30·15
K	Max	5·00	5·00	5·00	5·00
	Min	4·50	4·50	4·50	4·50
L		0°	0°	0°	0°
X	Max	37·85	48·13	60·07	75·82
	Min	37·59	47·88	59·82	75·56

SECTION 6 CORE BARRELS — 'WT' DESIGN

20. 'WT' Design Single Tube Core Barrel (BWT, NWT and HWT Sizes)

20.1 Nomenclature— A typical assembly of single tube core barrel of BWT, NWT and HWT sizes is shown below:



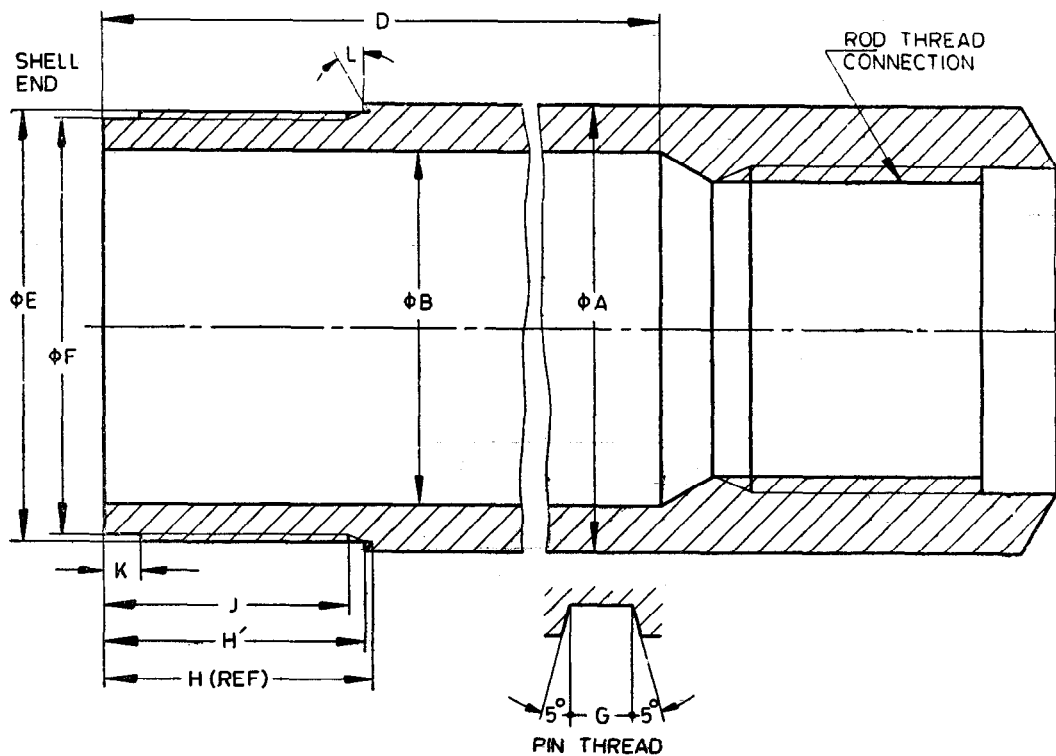
Reference Number	Description
1	Core bit
2	Core lifter
3	Reaming shell
4	Tube

20.1.1 Bits and core lifters of single tube core lifters are interchangeable with bits and core lifters of double tube core barrels (for dimensions see 21.1.2.1 and 21.1.2.2).

20.1.2 Standard 'WT' design core barrels shall have lengths of 1 500 mm, 3 000 mm, 6 000 mm and 6 000 mm (lengths refer to core capacity).

20.2 Detailed Dimensions

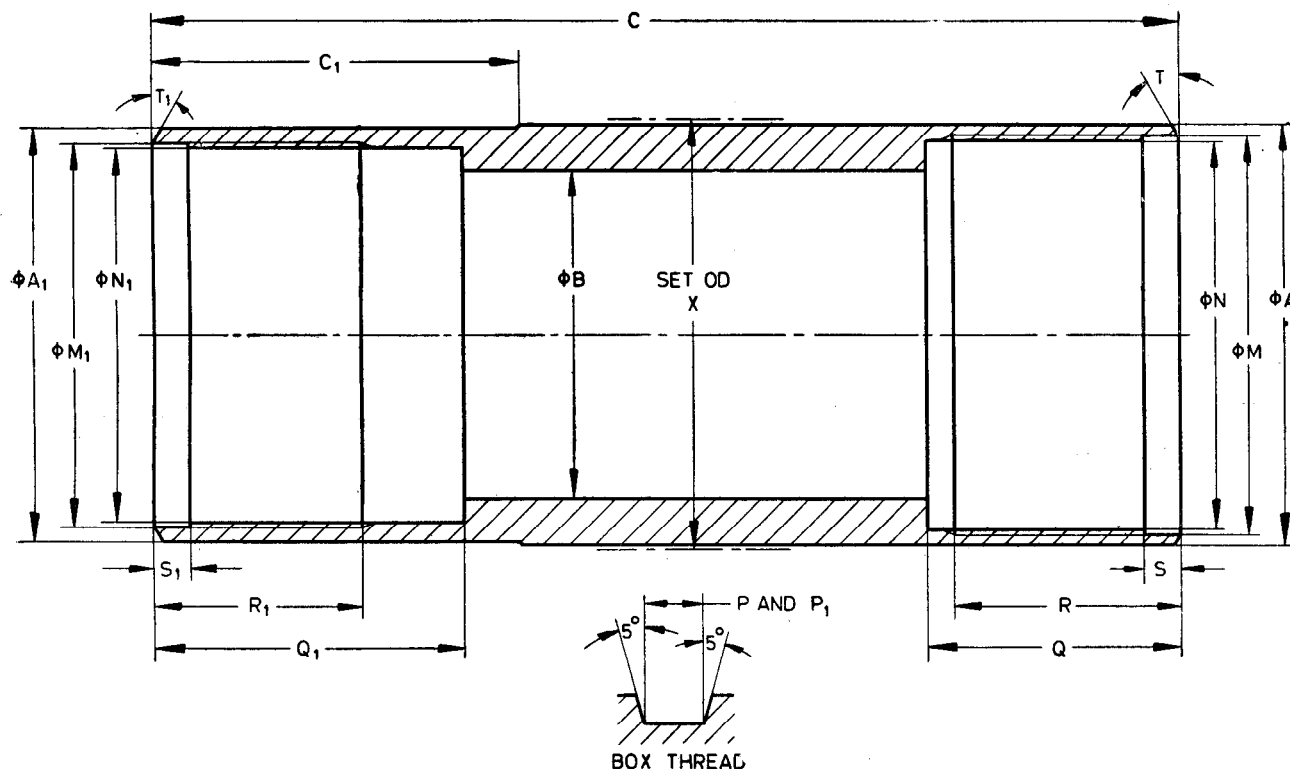
20.2.1 'WT' Design Single Tube Core Barrel — Tube



All dimensions in millimetres

Dimension		BWT	NWT	HWT
A	Max	58·98	74·07	97·21
	Min	58·72	73·81	96·82
B	Max	46·84	61·90	84·12
	Min	46·58	61·65	83·62
D	Min	2 981·32	2 981·32	2 981·32
E	Max	56·24	71·60	94·49
	Min	56·18	71·55	94·44
F	Max	54·66	70·03	92·91
	Min	54·58	69·95	92·79
Thread pitch		3·175	3·175	5·080
G	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
H	Max	5·28	38·43	44·81
	Min	35·15	38·30	44·68
H'	Max	34·93	38·11	44·47
	Min	34·80	37·98	44·34
J	Min	31·75	34·92	41·28
K	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·28
L		15°	15°	15°
Rod thread connection		BW	NW	HW

20.2.2 'WT' Design Single Tube Core Barrel — Reaming Shell



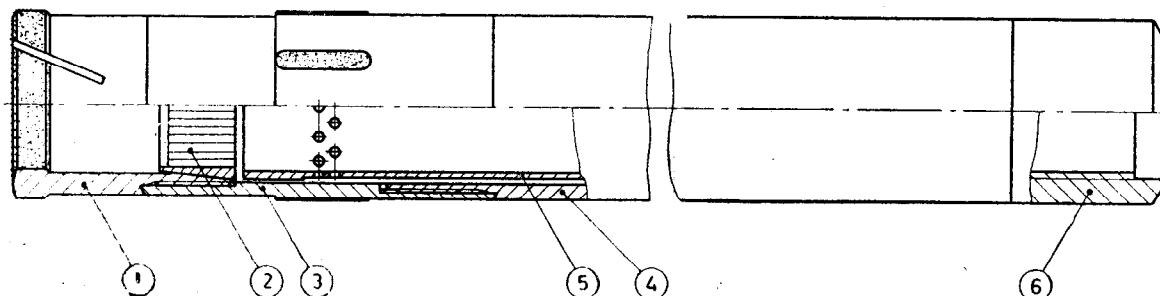
All dimensions in millimetres

Dimension		BWT	NWT	HWT
A	Max	58·93	74·55	97·94
	Min	58·83	74·45	97·84
A ₁	Max	58·60	74·27	97·71
	Min	58·50	74·17	97·61
B	Max	46·08	60·38	82·60
	Min	45·97	60·27	82·50
C	Max	168·91	175·26	191·14
	Min	168·28	174·62	190·50
C ₁	Max	51·18	54·36	63·88
	Min	50·42	53·59	63·12
M	Max	56·34	71·70	94·59
	Min	56·29	71·65	94·54
N	Max	54·76	70·13	93·01
	Min	54·71	70·08	92·96
Thread pitch		3·175	3·175	5·080
P	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
Q	Max	35·41	38·56	44·93
	Min	35·28	38·43	44·81
R	Max	32·25	35·42	41·78
	Min	31·75	34·92	41·28
S	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·20
T		15°	15°	15°
M ₁	Max	53·98	69·24	92·46
	Min	53·92	69·19	92·41
N ₁	Max	52·45	67·72	90·93
	Min	52·40	67·67	90·88
Thread pitch		3·175	3·175	5·080
P ₁	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
Q ₁	Max	42·85	46·02	54·25
	Min	42·34	45·52	53·75
R ₁	Max	29·08	32·25	38·60
	Min	28·58	31·75	38·10
S ₁	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·28
T ₁		15°	15°	15°
X	Max	60·07	75·82	99·36
	Min	59·82	75·56	99·11

21. 'WT' Design Double Tube Core Barrel

21.1 'WT' Design Double Tube Core Barrel (For BWT, NWT and HWT Sizes)

21.1.1 Nomenclature — A typical assembly of double tube core barrel of BWT, NWT and HWT sizes is shown below:



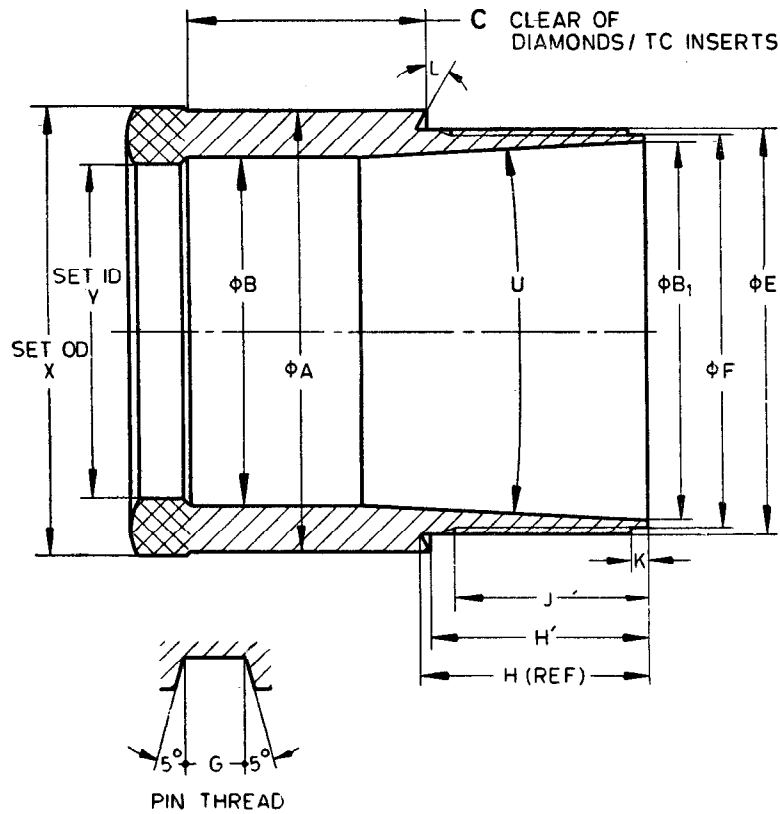
Ref No.	Description
1	Core bit
2	Core lifter
3	Reaming shell
4	Outer tube
5	Inner tube
6	Head-rigid or swivel

21.1.1.1 Bits and core lifters of double tube core barrels are interchangeable with single tube core barrels.

21.1.1.2 'WT' design double tube core barrels for BWT, NWT and HWT sizes shall have lengths of 1 500 mm, 3 000 mm and 6 000 mm (lengths refers to core capacity).

21.1.2 Detailed Dimensions

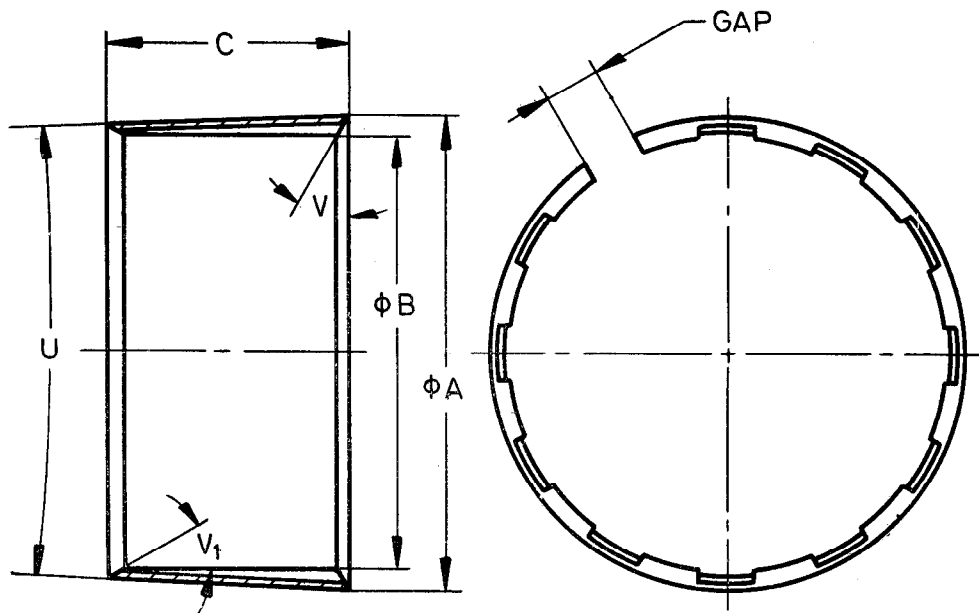
21.1.2.1 'WT' Design Double Tube Core Barrel — Bewel Wall Core Bit



All dimensions in millimetres

Dimension		HWT	NWT	HWT
A	Max	58·60	74·27	97·71
	Min	58·50	74·17	97·61
B	Max	46·23	60·53	82·73
	Min	45·97	60·27	82·47
B ₁	Max	50·39	65·74	88·75
	Min	50·29	65·03	88·65
C	Min	31·75	34·93	38·10
E	Max	53·87	69·14	92·35
	Min	53·82	69·09	92·30
F	Max	52·35	67·61	90·83
	Min	52·27	67·54	90·75
Thread pitch		3·175	3·175	5·080
G	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
H	Max	29·46	32·69	39·07
	Min	28·96	32·18	38·56
H'	Max	28·83	32·01	38·35
	Min	28·33	31·50	37·84
J	Min	26·40	28·58	34·93
K	Max	1·83	1·83	1·83
	Min	1·32	1·32	1·32
L		15°	15°	15°
U	Max	6°15'	6°15'	5°15'
	Min	5°45'	5°45'	4°45'
X	Max	59·69	75·44	98·98
	Min	59·44	75·18	98·60
Y	Max	44·58	58·88	81·08
	Min	44·32	58·62	80·82

21.1.2.2 'WT' Design Double Tube Core Barrel — Core Lifter



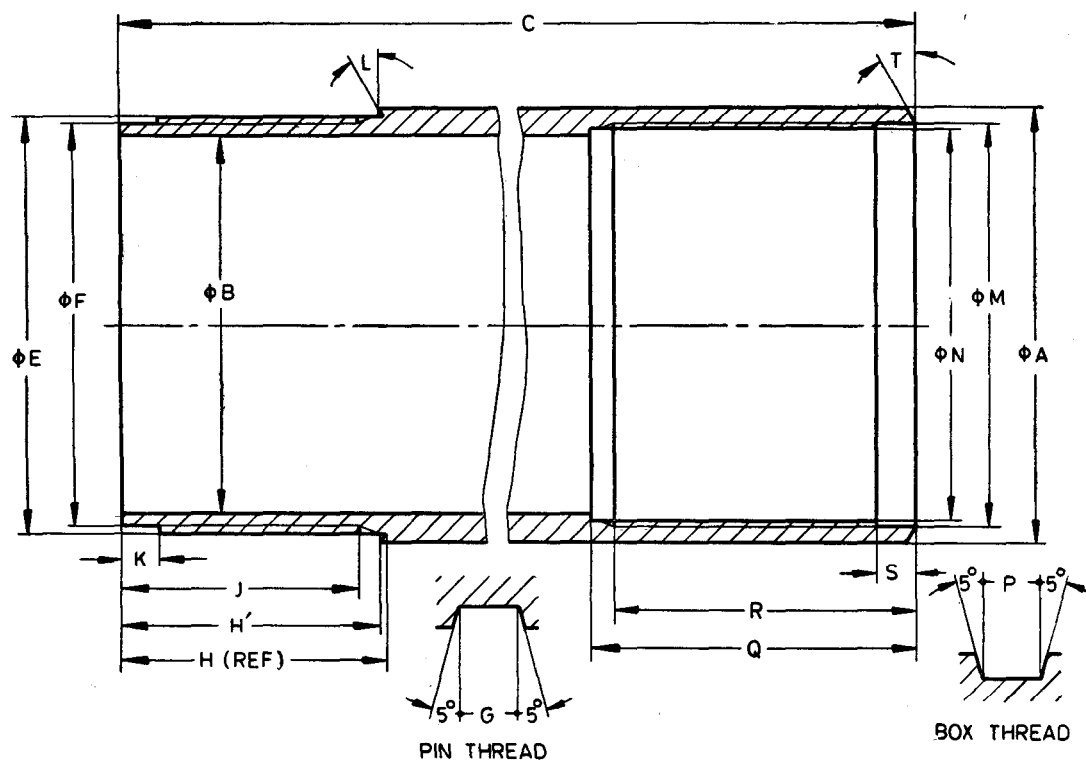
Note 1 — Width of gap, entry angle and number of flutes are at the discretion of manufacturer.

Note 2 — The core lifter with external flutes, if required by purchaser, shall conform to dimensions specified in this clause.

All dimensions in millimetres.

Dimension		BWT	NWT	HWT
A	Max	50·39	65·74	88·75
	Min	50·29	65·63	88·65
B	Max	43·94	58·24	80·31
	Min	43·84	58·14	80·21
C	Max	30·53	38·48	51·18
	Min	29·77	37·72	50·42
U	Max	6°15'	6°15'	5°15'
	Min	5°45'	5°45'	4°45'
V		10°	10°	10°
V ₁			Optional	

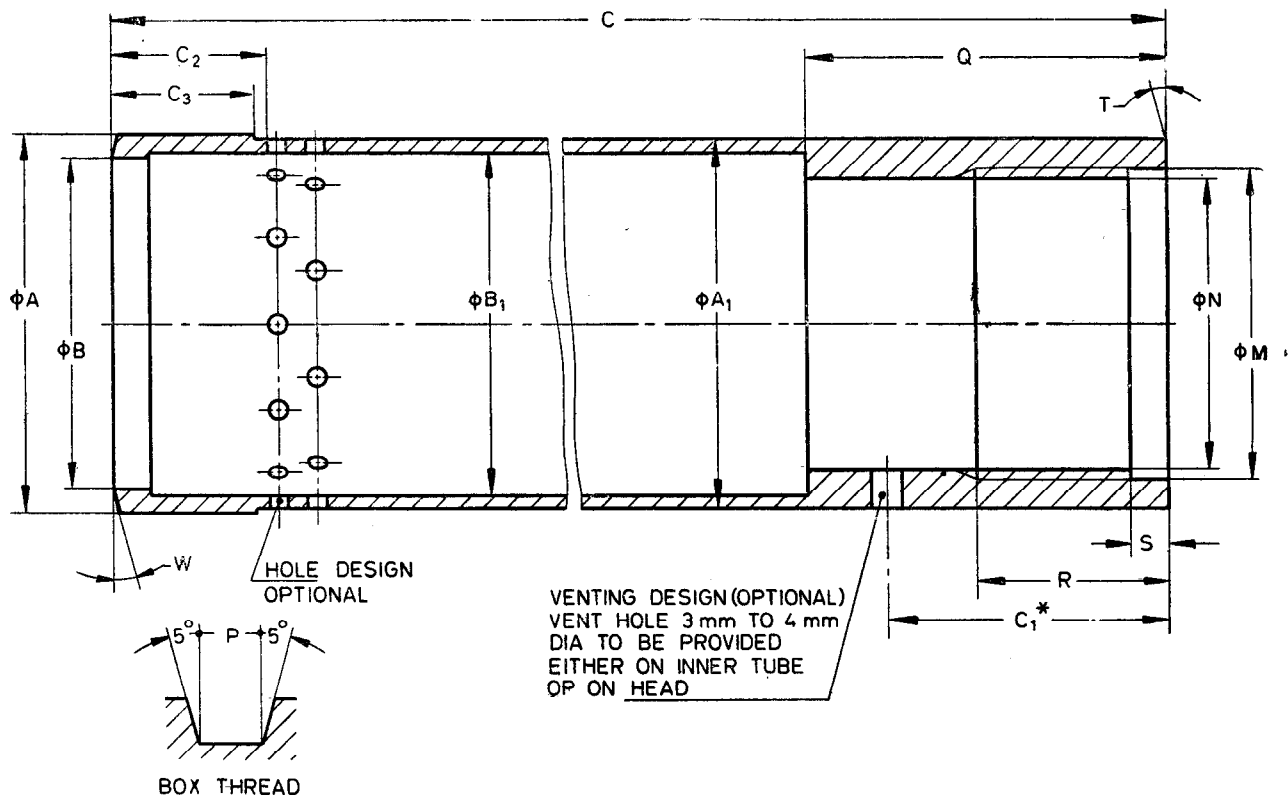
21.1.2.3 'WT' Design Double Tube Core Barrel — Outer Tube



All dimensions in millimetres

Dimension		BWT	NWT	HWT
A	Max	58·98	74·07	97·21
	Min	58·72	73·81	96·82
B	Max	51·59	66·68	88·90
	Min	51·33	66·42	88·39
C	Max	3 211·09	3 211·09	3 188·46
	Min	3 210·33	3 210·33	3 179·70
E	Max	56·24	71·60	94·49
	Min	56·18	71·55	94·44
F	Max	54·66	70·03	92·91
	Min	54·56	69·95	92·79
Thread pitch		3·175	3·175	5·080
G	Max	1·63	1·63	2·59
	Min	1·55	1·56	2·51
H	Max	35·28	38·43	44·81
	Min	35·15	38·30	44·68
H'	Max	34·93	38·11	44·47
	Min	34·80	37·96	44·34
J	Min	31·75	34·93	41·28
K	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·28
L		15°	15°	15°
M	Max	54·05	69·93	91·31
	Min	54·00	69·88	91·26
N	Max	52·45	68·33	89·71
	Min	52·40	68·28	89·66
Thread pitch		3·175	3·175	5·08
P	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
Q	Max	43·35	49·70	48·91
	Min	42·85	49·20	48·41
R	Max	40·17	46·52	45·74
	Min	39·67	46·02	45·24
S	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·28
T		30°	30°	15°

2.1.2.4 'WT' Design Double Tube Core Barrel — Inner Tube

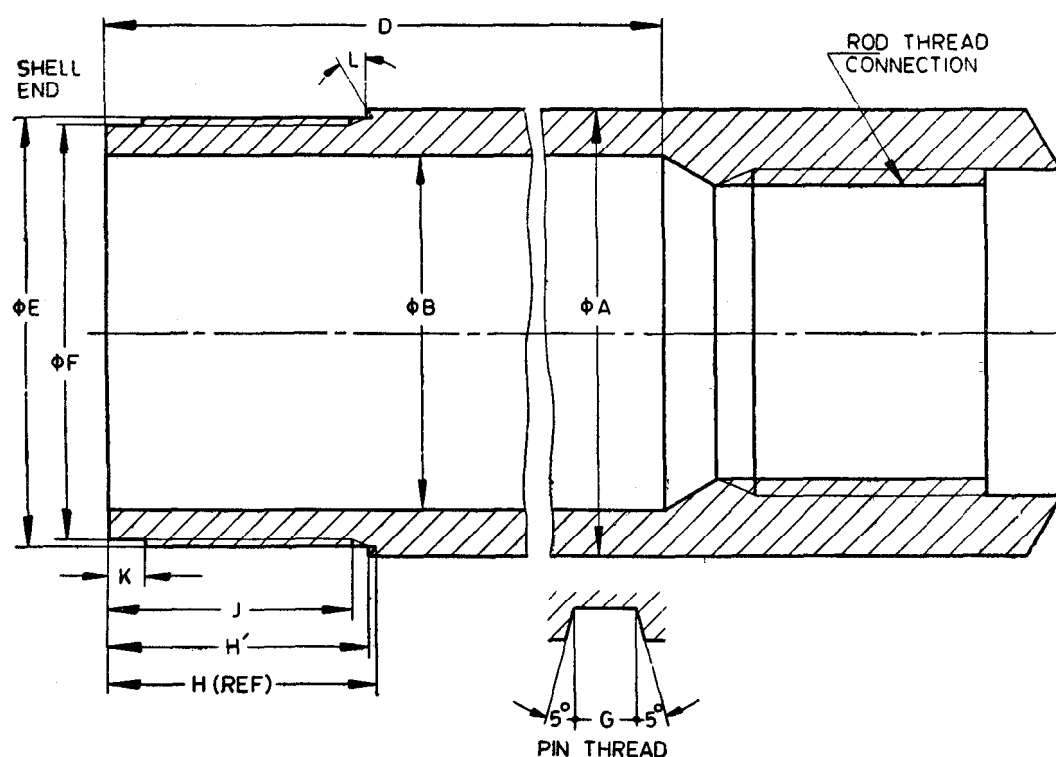


*Dimension C_1 is applicable only if vent hole is provided on inner tube.

All dimensions in millimetres

Dimension		BWT	NWT	HWT
A	Max	50·50	65·30	87·53
	Min	50·42	65·23	87·45
A_1	Max	49·45	63·75	85·98
	Min	49·20	63·53	85·73
B	Max	46·02	60·33	82·55
	Min	45·90	60·20	82·42
B_1	Max	46·02	60·33	82·55
	Min	45·77	60·07	82·04
C	Max	3 108·33	3 108·33	3 114·68
	Min	3 107·69	3 107·69	3 114·04
C_1	Max	37·26	40·44	43·61
	Min	35·74	38·91	42·09
C_2	Min	20·62	23·80	26·97
C_3	Max	19·43	22·61	25·78
	Min	19·05	22·23	25·40
M	Max	41·35	57·23	63·60
	Min	41·30	57·18	63·55
N	Max	38·96	54·84	61·49
	Min	38·91	54·79	61·44
Thread pitch		3·175	3·175	5·080
P	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
Q	Max	47·75	50·93	54·10
	Min	47·50	50·67	53·85
R	Max	25·9	29·08	32·25
	Min	26·4	28·58	31·75
S	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·28
T		0°	0°	0°
Holes (minimum total area), mm ²		238·70	325·16	419·35
W		10°	10°	10°

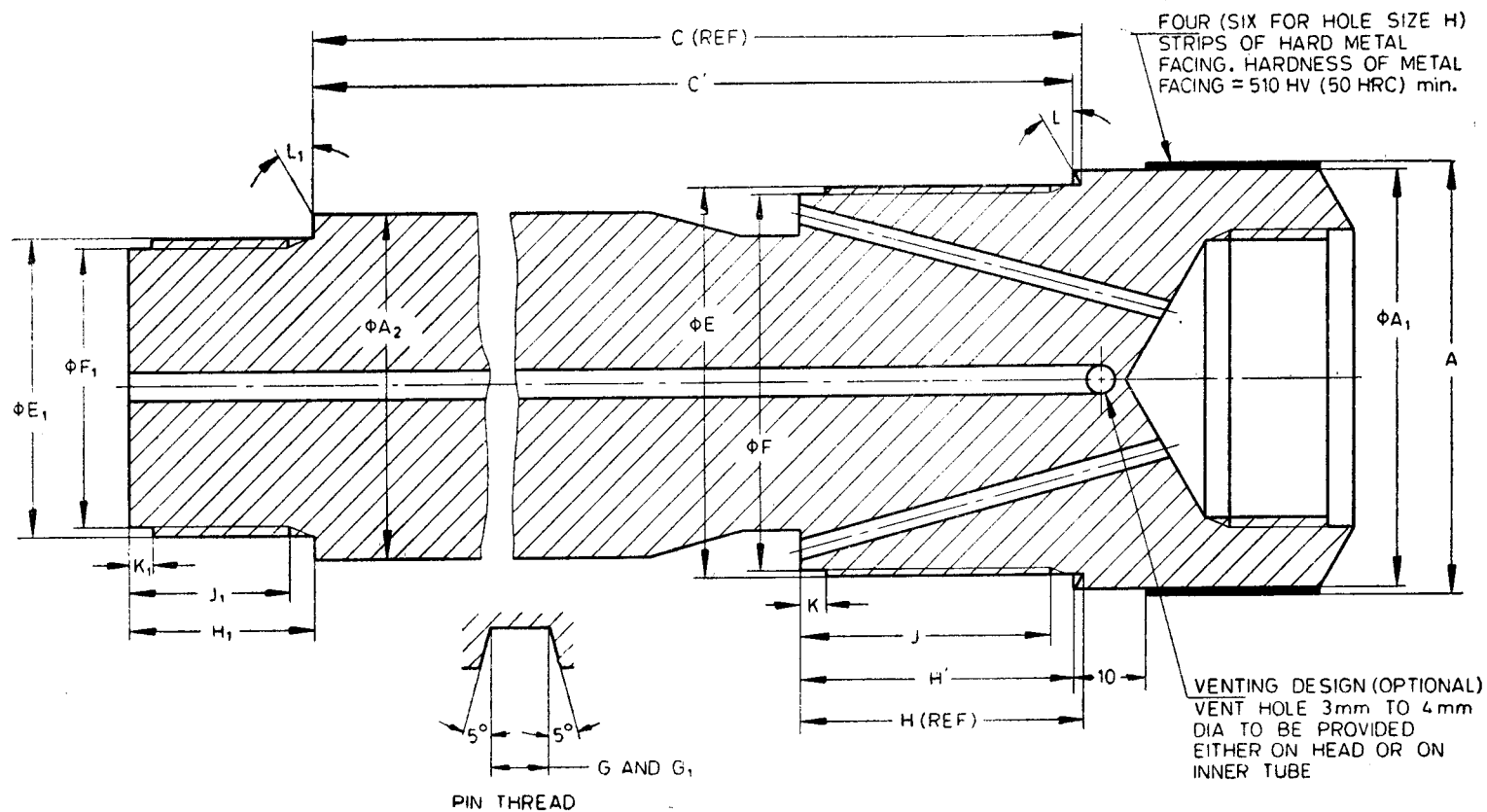
21.1.2.5 'WT' Design Double Tube Core Barrel — Reaming Shell



All dimensions in millimetres

Dimension		BWT	NWT	HWT
A	Max	58·93	74·55	97·94
	Min	58·83	74·45	97·84
A ₁	Max	58·60	74·27	97·71
	Min	58·50	74·17	97·61
B	Max	50·77	65·58	87·81
	Min	50·67	65·48	87·71
C	Max	143·56	149·86	165·76
	Min	143·05	149·35	165·25
C ₁	Max	51·18	54·36	63·88
	Min	50·42	53·59	63·12
M	Max	56·34	71·70	94·59
	Min	56·29	71·65	94·54
N	Max	54·76	70·13	93·01
	Min	54·71	70·08	92·96
Thread pitch		3·175	3·175	5·080
P	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
Q	Max	35·40	38·56	44·93
	Min	35·28	38·43	44·81
R	Max	32·25	35·33	41·78
	Min	31·75	34·95	41·28
S	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·28
T		15°	15°	15°
M ₁	Max	53·98	69·24	92·46
	Min	53·92	69·19	92·41
N ₁	Max	52·45	67·72	90·93
	Min	52·40	67·67	90·88
Thread pitch		3·175	3·175	5·080
P ₁	Max	1·63	1·63	2·59
	Min	1·55	1·55	2·51
Q ₁	Max	42·85	46·02	54·25
	Min	42·34	45·52	53·75
R ₁	Max	29·08	32·25	38·60
	Min	28·58	31·75	38·10
S ₁	Max	5·00	5·00	5·79
	Min	4·50	4·50	5·28
T ₁		15°	15°	15°
X	Max	60·07	75·82	99·36
	Min	59·82	75·56	99·11

21.1.2.6 'WT' Design Double Tube Core Barrel — Head



Note — The hardness of metal strip in *HRC* is approximate value.

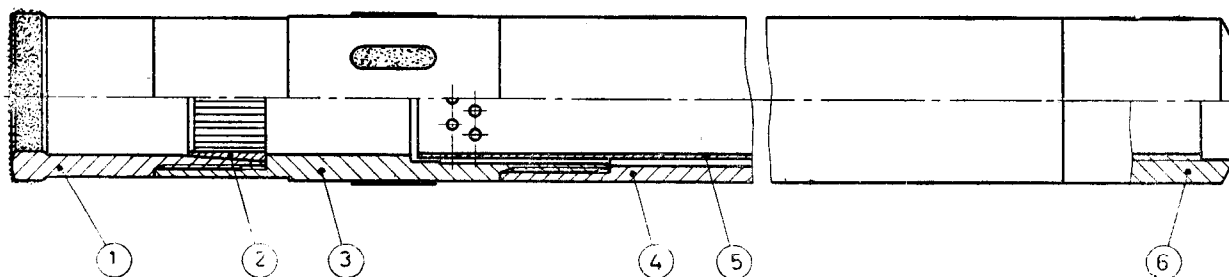
All dimensions in millimetres

Dimension		*BWT	*NWT	HWT
A	Max	58.93	74.55	97.78
	Min	58.81	74.43	97.66
A ₁	Max	58.06	73.94	97.03
	Min	57.81	73.69	96.65
A ₂	Max	47.88	63.75	85.98
	Min	47.63	63.50	85.73
C	Max	170.54	170.54	134.42
	Min	169.90	169.90	133.78
C'	Max	169.38	169.38	133.66
	Min	168.74	168.74	133.02
E	Max	53.95	69.82	91.21
	Min	53.90	69.77	91.16
F	Max	52.35	68.22	89.61
	Min	52.22	68.10	89.48
Thread pitch		3.175	3.175	5.080
G	Max	1.63	1.63	2.59
	Min	1.55	1.55	2.51
H	Max	39.27	45.62	45.21
	Min	38.89	45.24	44.83
H'	Max	38.11	44.46	44.45
	Min	37.73	44.08	44.07
J	Min	34.93	41.28	41.28
K	Max	3.43	3.43	3.43
	Min	2.92	2.92	2.92
L		30°	30°	15°
E ₁	Max	41.25	57.12	63.50
	Min	41.20	57.07	63.45
F ₁	Max	38.86	54.74	61.39
	Min	38.4	54.61	61.26
Thread pitch		3.175	3.175	5.080
G ₁	Max	1.63	1.63	2.59
	Min	1.55	1.55	2.51
H ₁	Max	25.40	28.58	31.75
	Min	25.02	28.19	31.37
J ₁	Min	22.23	25.40	28.58
K ₁	Max	3.43	3.43	3.43
	Min	2.92	2.92	2.92
L ₁		0°	0°	0°
Rod thread connection		BW	NW	HW

*These items are interchangeable with BWM and NWM.

21.2 'WT' Design Double Tube Core Barrel (for RWT, EWT and AWT Sizes)

21.2.1 Nomenclature — A typical assembly of double tube core barrel of RWT, EWT and AWT sizes is shown below:



Reference Number	Description
1	Core bit bevel wall
or 1	Core bit straight wall
2	Core lifter
3	Reaming shell
4	Outer tube
5	Inner tube
6	Head-rigid type

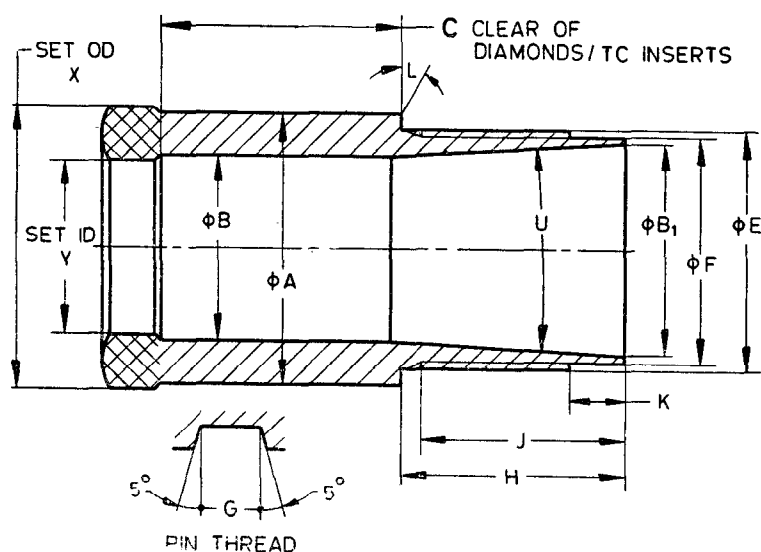
21.2.1.1 No core lifter is used with straight walled bits.

21.2.1.2 'WT' design double tube core barrels of RWT, EWT and AWT sizes shall have lengths of 1 500 mm, 3 000 mm and 6 000 mm (lengths refer to core capacity).

21.2.1.3 Unless otherwise specified bevel wall core bit shall be supplied.

21.2.2 Detailed Dimensions

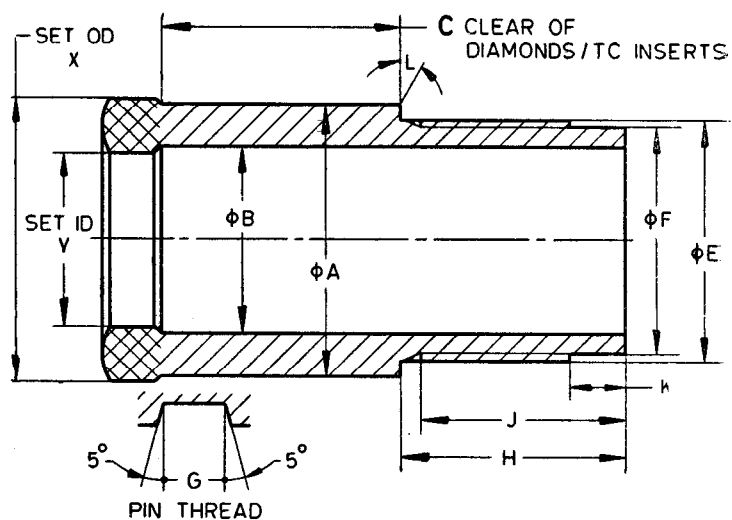
21.2.2.1 'WT' Design Double Tube Core Barrel — Bevel Wall Core Bit



All dimensions in millimetres

Dimension		RWT	EWT	AWT
A	Max	28.75	36.25	46.66
	Min	28.65	36.14	46.56
B	Max	19.81	24.76	34.32
	Min	19.43	24.51	34.06
B_1	Max	22.58	28.60	38.91
	Min	22.53	28.50	38.81
C	Min	28.58	31.75	31.75
E	Max	24.56	31.72	42.04
	Min	24.51	31.67	41.99
F	Max	23.37	30.12	40.44
	Min	23.32	30.05	40.34
Thread pitch		3.175	3.175	3.175
G	Max	1.63	1.63	1.63
	Min	1.55	1.55	1.55
H	Max	22.48	29.62	32.79
	Min	21.97	29.11	32.28
J	Max	19.84	26.97	30.15
K	Max	5.00	7.39	7.39
	Min	4.50	6.88	6.88
L		0°	0°	0°
U	Max	8°15'	7°15'	7°15'
	Min	7°45'	6°45'	6°45'
X	Max	29.59	37.46	47.75
	Min	29.34	37.21	47.50
Y	Max	18.80	23.11	32.66
	Min	18.54	22.86	32.41

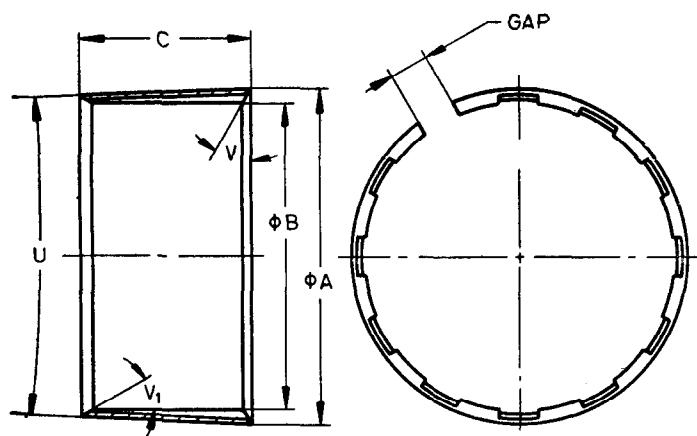
21.2.2.2 'WT' Design Double Tube Core Barrel — Straight Wall Core Bit



All dimensions in millimetres

Dimension		RWT	EWT	AWT
A	Max	28.75	36.25	46.66
	Min	28.65	36.14	46.56
B	Max	19.81	24.76	34.32
	Min	19.43	24.51	34.06
C	Min	28.58	31.75	31.75
E	Max	24.56	31.72	42.04
	Min	24.51	31.67	41.99
F	Max	23.37	30.12	40.44
	Min	23.32	30.05	40.34
Thread pitch		3.175	3.175	3.175
G	Max	1.63	1.63	1.63
	Min	1.55	1.55	1.55
H	Max	27.20	29.62	32.79
	Min	26.70	29.11	32.28
J	Min	24.59	26.97	30.15
K	Max	6.60	7.39	7.39
	Min	6.10	6.83	6.88
L		0°	0°	0°
X	Max	29.59	37.46	47.75
	Min	29.34	37.21	47.50
Y	Max	18.80	23.11	32.66
	Min	18.54	22.86	32.41

21.2.2.3 'WT' Design Double Tube Core Barrel — Core Lifters



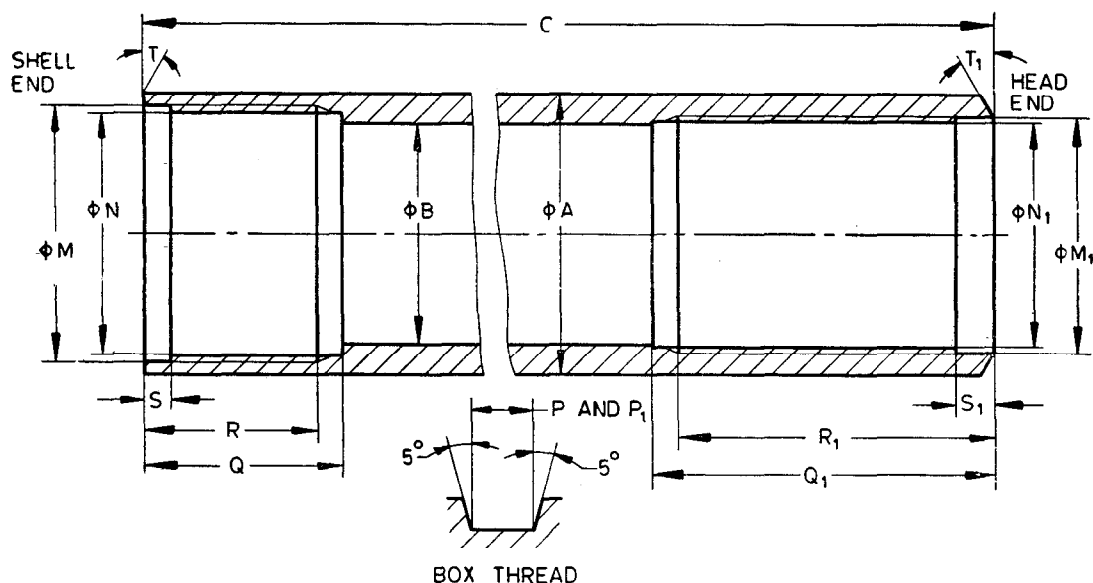
Note 1 — Width of gap, entry angle and number of flutes are at the discretion of manufacturer.

Note 2 — Core lifters with external flutes, if required by purchaser, shall conform to the dimensions specified in this clause.

All dimensions in millimetres

Dimension		RWT	EWT	AWT
A	Max	22·91	27·58	37·80
	Min	22·81	27·48	37·69
B	Max	18·29	22·61	32·16
	Min	18·19	22·50	32·05
C	Max	16·26	19·43	22·61
	Min	15·49	18·67	21·84
U	Max	8°15'	7°15'	7°15'
	Min	7°45'	6°45'	6°45'
V		0°	0°	0°
V ₁	Optional			

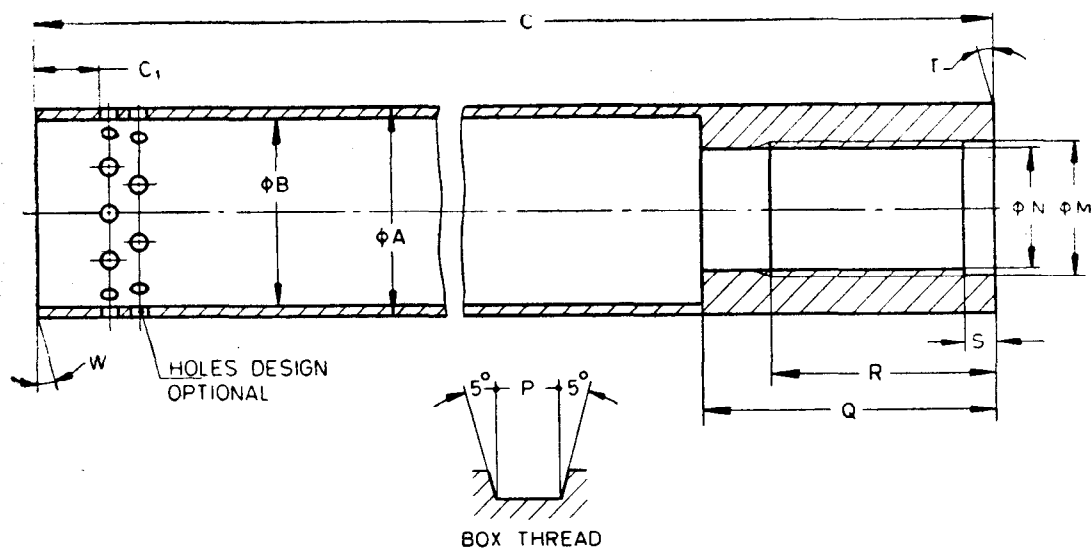
21.2.2.4 'WT' Design Double Core Barrel — Outer Tube



All dimensions in millimetres

Dimension		RWT	EWI	AWT
A	Max	28.70	36.63	47.07
	Min	28.58	36.50	46.81
B	Max	22.61	28.96	38.89
	Min	22.48	28.83	38.63
C	Max	3 063.06	3 035.68	3 048.38
	Min	3 062.27	3 034.89	3 047.59
M	Max	24.66	33.40	42.93
	Min	24.61	33.35	42.88
N	Max	23.47	31.83	41.35
	Min	23.42	31.78	41.30
Thread pitch		3.175	3.175	3.175
P	Max	1.63	1.63	1.63
	Min	1.55	1.55	1.55
Q	Max	19.05	25.60	31.95
	Min	18.64	25.40	31.75
R	Max	16.38	22.72	29.08
	Min	15.88	22.22	28.58
S	Max	3.43	3.43	3.43
	Min	2.92	2.92	2.92
T		0°	0°	0°
M ₁	Max	24.66	31.01	41.35
	Min	24.61	30.96	41.30
N ₁	Max	23.47	29.44	39.75
	Min	23.42	29.39	39.70
Thread pitch		3.175	3.175	3.175
P ₁	Max	1.63	1.63	1.63
	Min	1.55	1.55	1.55
Q ₁	Max	30.65	44.95	51.30
	Min	30.15	44.45	50.80
R ₁	Max	27.47	41.78	48.12
	Min	26.97	41.28	47.62
S ₁	Max	4.22	5.00	5.00
	Min	3.71	4.50	4.50
T ₁		30°	30°	30°

21.2.2.5 'WT' Design Double Tube Core Barrel — Inner Tube

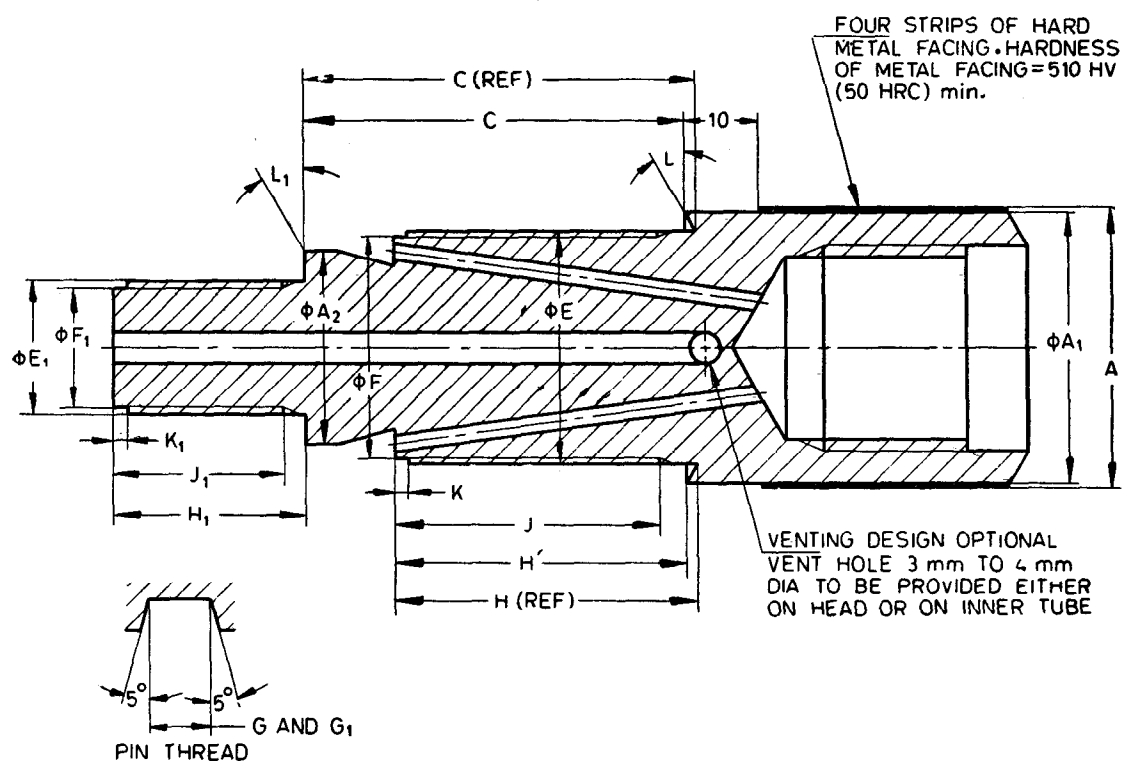


All dimensions in millimetres

Dimension		RWT	EWT	AWT
A	Max	21·16	27·10	36·63
	Min	21·03	26·97	36·50
B	Max	19·43	24·59	34·11
	Min	19·33	24·46	33·86
C	Max	3 016·25	3 009·90	3 014·65
	Min	3 015·46	3 009·09	3 013·89
C ₁	Min	6·73	8·33	8·33
M	Max	*	17·53	25·48
	Min	*	17·48	25·43
N	Max	*	15·95	23·88
	Min	*	15·90	23·83
Thread pitch		*	3·175	3·175
P	Max	*	1·63	1·63
	Min	*	1·55	1·55
Q	Max	12·83	38·23	50·93
	Min	12·57	37·97	50·67
R	Max	*	29·08	29·08
	Min	*	28·58	28·58
S	Max	3·43	3·81	3·81
	Min	2·92	3·30	3·30
T		0°	0°	0°
Holes (minimum total area), mm ²		81·92	142·55	185·76
W		0°	0°	0°

* The thread dimensions for RWT sizes shall be according to established practices.

21.2.2.6 'WT' Design Double Tube Core Barrel — Head

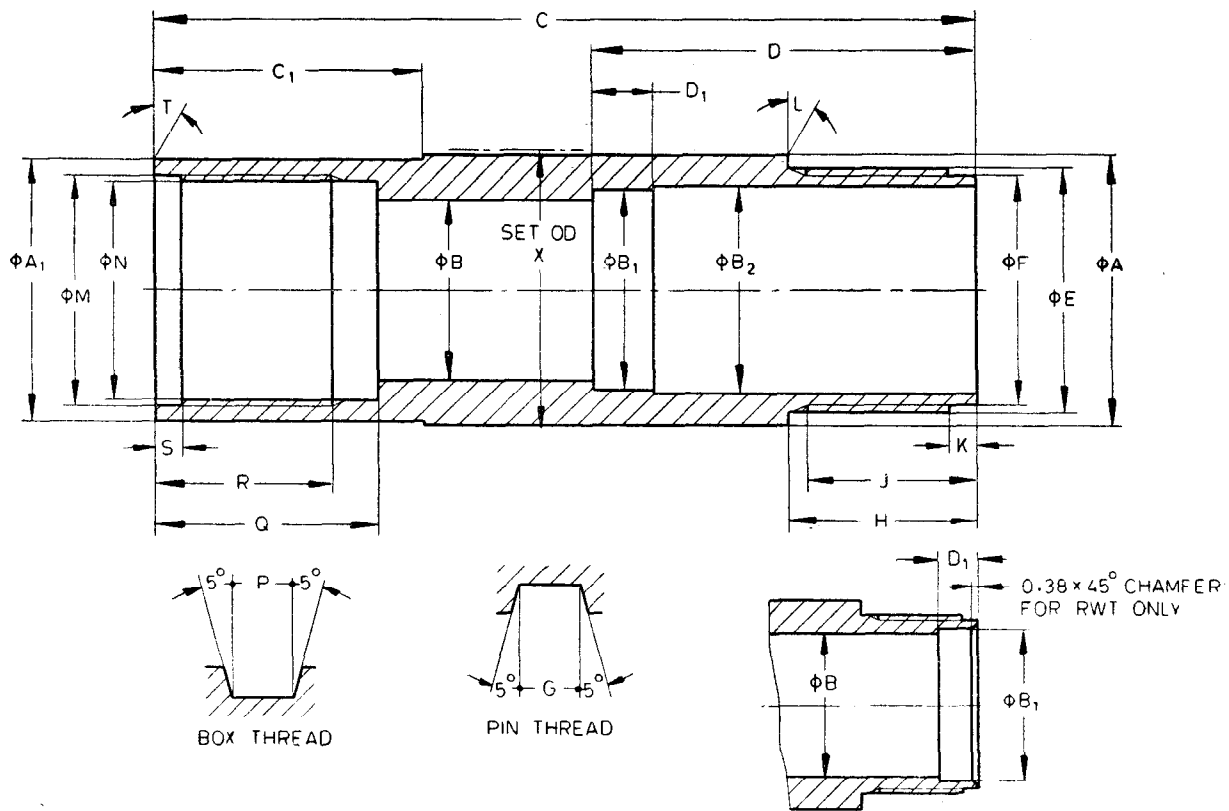


Note — The hardness of metal facing in HRC is approximate value.

All dimensions in millimetres

Dimension		RWT	EWT	AWT
A	Max	29.10	36.90	47.12
	Min	28.98	36.78	47.00
A ₁	Max	28.70	36.63	47.07
	Min	28.45	36.37	46.81
A ₂	Max	21.16	25.53	35.05
	Min	21.03	25.40	34.92
C	Max	34.82	51.16	59.11
	Min	34.44	50.77	58.72
C'	Max	33.65	49.54	57.46
	Min	33.27	49.15	57.07
E	Max	24.56	30.91	41.25
	Min	24.51	30.86	41.20
F	Max	23.37	29.34	39.65
	Min	23.32	29.29	39.60
Thread pitch		3.175	3.175	3.175
G	Max	1.63	1.63	1.63
	Min	1.55	1.55	1.55
H	Max	26.57	39.73	46.10
	Min	26.19	39.34	45.72
H'	Max	25.40	38.11	44.45
	Min	25.02	37.72	44.07
J	Min	23.01	34.92	41.28
K	Max	1.70	1.70	1.70
	Min	1.45	1.45	1.45
L		30°	30°	30°
E ₁	Max	*	17.42	25.37
	Min	*	17.37	25.32
F ₁	Max	*	15.85	23.77
	Min	*	15.80	23.72
Thread pitch		*	3.175	3.175
G ₁	Max	*	1.63	1.63
	Min	*	1.55	1.55
H ₁	Max	12.70	25.40	25.40
	Min	12.32	25.02	25.02
J ₁	Min	10.16	22.22	22.22
	Max	1.70	1.70	1.70
K ₁	Min	1.45	1.45	1.45
L ₁		0°	0°	0°
Rod thread connection		RW	EW	AW
*The thread dimensions for RWT size shall be according to established practices.				

21.2.2.7 'WT' Design Double Tube Core Barrel — Reaming Shell



All dimensions in millimetres

Dimension		RWT	EWT	AWT
A	Max	28.75	36.96	47.14
	Min	28.65	36.86	47.04
A ₁	Max	28.75	36.25	46.66
	Min	28.65	36.14	46.56
B	Max	19.81	24.76	34.32
	Min	19.43	24.51	34.06
B ₁	Max	21.46	27.51	37.03
	Min	21.33	27.25	36.78
B ₂	Max	—	28.63	37.82
	Min	—	28.52	37.69
C	Max	92.58	111.63	133.86
	Min	92.08	111.12	133.35
C ₁	Max	—	36.63	39.80
	Min	—	36.50	39.67
D	Max	—	51.97	58.32
	Min	—	51.59	57.94
D ₁	Max	5.21	8.26	8.26
	Min	4.83	7.87	7.87
E	Max	24.56	33.30	42.82
	Min	24.51	33.25	42.77
F	Max	23.37	31.72	41.25
	Min	23.32	31.67	41.20
Thread pitch		3.175	3.175	3.175
G	Max	1.63	1.63	1.63
	Min	1.55	1.55	1.55
H	Max	16.08	25.40	31.75
	Min	15.88	25.20	31.55
J	Min	13.49	23.01	28.58
K	Max	1.83	3.43	3.43
	Min	1.32	2.92	2.92
L		0°	0°	0°
M	Max	24.66	31.83	42.14
	Min	24.61	31.78	42.09
N	Max	23.47	30.23	40.54
	Min	23.42	30.18	40.49
Thread pitch		3.175	3.175	3.175
P	Max	1.63	1.63	1.63
	Min	1.55	1.55	1.55
Q	Max	28.70	30.28	33.45
	Min	28.58	30.15	33.32
R	Max	22.72	24.30	27.47
	Min	22.22	23.80	26.97
S	Max	3.43	3.43	3.43
	Min	2.92	2.92	2.92
T		0°	0°	0°
X	Max	29.97	37.85	48.13
	Min	29.72	37.59	47.88

EXPLANATORY NOTE

The diamond core drilling equipment as specified in this standard are characterised by a series of hole sizes specifically designed for wide nesting, permitting relatively greater reduction in the hole diameters as the depth of the hole increases and employing relatively heavy casings between the hole sizes.

In the preparation of this standard, considerable assistance has been derived from the following:

ISO/DIS 3551/1,2 'Diamond core drilling equipment — System A: Part I Metric units' issued by the International Organization for Standardization.

BS: 4019 Part I-1974 'Rotary core drilling equipment Part 1 Diamond core drilling equipment' issued by the British Standards Institution.

AMENDMENT NO. 1 APRIL 1990

TO

IS : 10208 - 1982 SPECIFICATION FOR DIAMOND CORE DRILLING EQUIPMENT

<i>S No.</i>	<i>Page of IS : 10208-1982</i>	<i>Dimension</i>	<i>Alterations</i>
1.	5	EW Casing Shoe Set ID	Substitute ' 37·80 ' for ' 37·90 '.
2.	5	HW Rod Tube OD	Substitute ' 88·50 ' for ' 88·90 '.
3.	5	HW Casing Bit Set OD	Substitute ' 117·65 ' for ' 117·68 '.
4.	5	PW Casing OD	Substitute ' 138·66 ' for ' 136·86 '.
5.	5	PW Casing Shoe Set ID	Substitute ' 121·54 ' for ' 121·64 '.
6.	5	SW Casing Shoe Set ID	Substitute ' 146·56 ' for ' 146·58 '.
7.	6	BWG/BWM Coring Bits Set ID	Substitute ' 42·16 ' for ' 42·10 '.
8.	10	A/AW, <i>Min</i>	Substitute ' 43·64 ' for ' 43·84 '.
9.	10	S/EW, <i>Max</i>	Substitute ' 8·18 ' for ' 8·15 '.
10.	19	Thread pitch for AW between F and G	Substitute ' 6·350 ' for ' 0 '.
11.	21	P/PX, <i>Min</i>	Substitute ' 2·46 ' for ' 2·51 '.
12.	22	R/ZX, <i>Min</i>	Substitute ' 85·73 ' for ' 85·13 '.
13.	34	E/NWF*, <i>Min</i>	Substitute ' 71·55 ' for ' 71·65 '.
	43	B <i>Max</i> B <i>Min</i>	Substitute the following for the existing matter:

Dimension		HWF	PWF	SWF	UWF	ZWF
B	<i>Max</i>	85·85	105·03	127·36	155·98	181·38
	<i>Min</i>	85·34	104·5	126·64	151·17	180·57

15.	46	J/UWF, <i>Min</i>	Substitute ' 53·98 ' for ' 63·98 '.
		J/ZWF, <i>Min</i>	Substitute ' 53·98 ' for ' 63·98 '.
16.	50	HWG Thread Pitch	Substitute ' 5·08 ' for ' 3·175 '.
17.	52	A/AWG, <i>Min</i>	Substitute ' 46·02 ' for ' 40·02 '.
18.	53	Title of last column	Substitute ' HWG ' for ' HWB '.
19.	55	C/EWG, <i>Min</i>	Substitute ' 3 146·22 ' for ' 3 147·22 '.
20.	55	Q <i>Max</i> Q <i>Min</i>	Substitute the following for the existing matter:

Dimension		EWG	AWG	BWG	NWG	WG
Q	<i>Min</i>	46·00	58·70	58·70	58·70	34) 2

21.	55	R <i>Max</i> R <i>Min</i>	Substitute the following for the existing matter:
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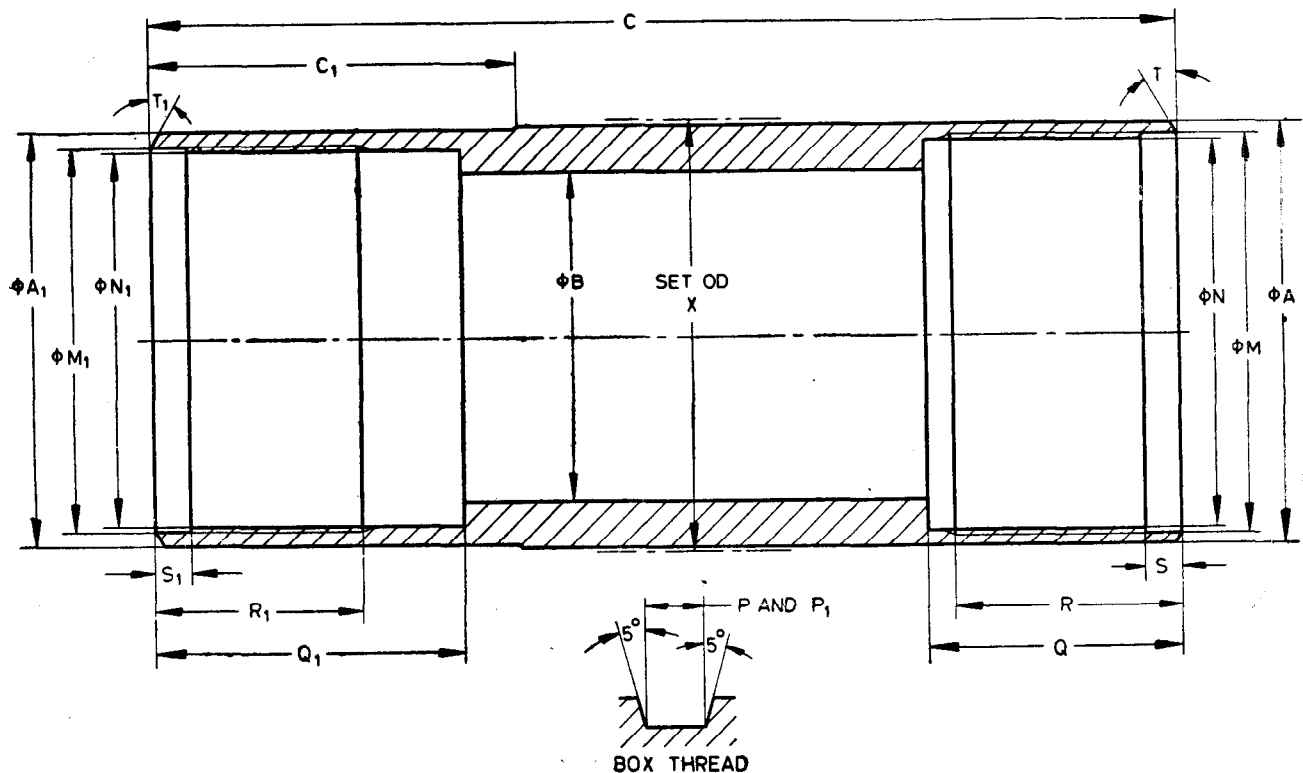
Dimension		EWG	AWG	BWG	NWG	HWG
R	<i>Min</i>	42·90	55·60	55·60	55·60	31·75

22.	56	C/HWG, <i>Max</i> and <i>Min</i>	Substitute ' 3 078·96 and 3 078·18 ' for ' 3 114·68 and 3 113·89 '.
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23.	61	B/BWM, Max and Min	Substitute ' 46·81 and 46·69 ' for ' 48·81 and 48·69 '.
24.	61	M/EWM, Max	Substitute ' 33·40 ' for ' 33·48 '.
25.	61	M/BWM, Max	Substitute ' 54·05 ' for ' 54·03 '.
26.	61	M/NWM, Min	Substitute ' 70·66 ' for ' 70·63 '.
27.	61	X/NWM, Min	Substitute ' 75·18 ' for ' 75·16 '.
28.	61	Y/NWM, Max	Substitute ' 54·86 ' for ' 54·88 '.
29.	64	Q_1 Max Q_1 Min R_1 , Min	Substitute the following for the existing matter:

Dimension		EWM	AWM	BWM	NWM
Q_1	Min	46·05	58·75	58·75	58·75
R_1	Min	42·88	55·58	55·58	55·58

30.	70	H/BWT, Max	Substitute ' 35·28 ' for ' 5·28 '.
31.	73	Title of Second Column	Substitute ' BWT ' for ' HWT '.
32.	73	B_1 /NWT, Min	Substitute ' 65·63 ' for ' 65·03 '.
33.	73	H/NWT, Min	Substitute ' 32·18 ' for ' 82·18 '.
34.	73	J/HWT, Min	Substitute ' 25·40 ' for ' 26·40 '.
35.	75	C/HWT, Max	Substitute ' 3 180·46 ' for ' 3 188·46 '.
36.	75	F/BWT, Min	Substitute ' 54·58 ' for ' 54·56 '.
37.	76	(Clause 2.1.2.4)	Substitute ' 21.1.2.4 ' for ' 2.1.2.4 '.
38.	76	A_1 /NWT, Min	Substitute ' 63·50 ' for ' 63·53 '.
39.	76	R/BWT, Min	Substitute ' 25·40 ' for ' 26·4 '.
40.	77	Drawing	Substitute the following for the existing figure:



41. 79 F_1/BWT , Min
42. 87 J_1 Min
 K_1 Max
 K_1 , Min

Substitute ' 38.74 ' for ' 38.4 '.

Substitute the following for the existing matter:

Dimension		RWT	EWT	AWT
J_1	Min	10.16	22.22	22.22
K_1	Max	1.70	1.70	1.70
	Min	1.45	1.45	1.45

43. General Thread Pitch

The thread pitches shall be read rounded off to two decimal places in accordance with IS : 2-1960 ' Rules for rounding off numerical values (revised) '.

AMENDMENT NO. 2 OCTOBER 2005
TO
IS 10208 : 1982 SPECIFICATION FOR
DIAMOND CORE DRILLING EQUIPMENT

(*Page 20, clause 14.1.5, informal table, Dimension column, first row*) —
Insert 'A'.

(*Page 29, clause 15.2.1, informal table, Dimension B, fourth column*) —
Substitute '56.77' for '6.77'.

(*Page 67, clause 19.2.6, informal table*) — Insert the following at the
end:

‘*These items are interchangeable with the ‘WG’ design core barrels.

†These items are interchangeable with the ‘WT’ design core barrels.’